

COUES (Elliott)

Synopsis of the reptiles
and batrachians of Arizona —

(Chapter V.)

Case

CHAPTER V.

SYNOPSIS

OF THE

REPTILES AND BATRACHIANS

OF

ARIZONA;

WITH

CRITICAL AND FIELD NOTES, AND AN EXTENSIVE SYNONYMY.

BY

DR. ELLIOTT COUES, U. S. ARMY.



CHAPTER V.

INTRODUCTORY.

This article rests primarily upon the collections and observations made by the writer in Arizona in 1864-65. These collections, containing many new species, were placed, together with the author's field notes, in the hands of Prof. E. D. Cope, by whom the new species were described in a paper published in the Proceedings of the Philadelphia Academy for 1866. Special reference is made to this paper, which contained, furthermore, the identification of the species, forty-four in number, contained in the collections, with some of the author's field notes, critical observations of Professor Cope's, and an enumeration of the additional species then known to inhabit the Territory, sixty-eight in number.

The present paper was drawn up some years since to form part of a General Work upon the Natural History of Arizona, which the author then contemplated, but which pressure of other engagements compelled him to abandon. During the time it has lain in manuscript, it has been retouched at intervals, with the addition of various matter, until it has assumed the present shape of a synopsis of the species now known to inhabit the Territory, eighty-three in number (exclusive of numerous subspecies).

The aim has been to include none which have not actually been found in Arizona as at present bounded. It will be remembered that the present Territory includes the western half of what was formerly New Mexico, together with a considerable part of Sonora, obtained by what is known as the "Gadsden purchase"; consequently, many species described from "New Mexico" and "Sonora" are really Arizonan.

Doubtless some species already known to inhabit this Territory have not come to the writer's knowledge as such, but it is believed that these are very few; and, no doubt, also species remain to be discovered in this region,

so fertile in reptilian life. But the present article is believed to be a fair *résumé* of the subject as at present understood. To render it more generally available, and useful as a work of reference, a copious bibliography has been prepared, representing a large proportion of extant references, and a nearly complete synonymy. Descriptions of lately published or less generally known species are given in many cases, together with such critical and field notes as the author found himself in position to offer.

The classification adopted is that of the eminent herpetologist, Professor Cope, whose nomenclature is followed in the main, though a different stand is taken in some instances; and the identifications of species are mainly upon the same authority, the author's work being little more in this instance than that of a compiler.

The most striking feature of the batrachian fauna of Arizona is the poverty of this region in *Urodela* (one species), which bear small proportion, in numbers of species or of individuals, to the *Anura* (eight species), in comparison with the ratio existing between these two groups in most parts of the United States; while the *Anura* themselves are poorly represented. This is probably due in greatest part to the dryness of the region as a whole. The *Chelonia* (four or five species) are likewise poorly represented, for the same reason. On the other hand, the region is rich in *Ophidia* (thirty-four species), including a larger proportion of venomous species than any other district of the United States; and it is still richer in number of individuals and of species of *Sauria* (thirty-six species). No other portion of our country exhibits such a preponderance of these forms of animal life.

NOTE.

Since the present paper was set in metal, a few *addenda* have come to my knowledge, being indicated as Arizonan in the preceding article by Dr. Yarrow. Such are *Phrynosoma blainvillii*, *Sceloporus tristichus* (sp. n.), *S. spinosus*, *Chilopoma rufopunctatum* (g. s. n.), *Pityophis sayi mexicanus*, *Diadophis pulchellus*, *Ophibolus doliatus annulatus*, *Bufo lentiginosus cognatus*, *B. punctatus*. But the close connection of the two memoirs renders their omission of less consequence.

November 15, 1875.

A.—REPTILIA.

CHELONIA. CRYPTODIRA. CINOSTERNIDAE.

1. *Aromochelys carinatus*, Gray.

Aromochelys carinatus, GRAY, Cat. Shield Reptiles Brit. Mus.—COPE, Proc. Acad. Nat. Sci. Phila., 1866, 310.—*Id.*, Check-List, 1875, 52.
Ozotheca tristycha, AGASS., Contrib. Nat. Hist. U. S., i, 1857, 425, pl. 5, figs. 20-22.—BD., U. S. & Mex. Bound. Surv., ii, pt. ii, 1859, Reptiles, 3.

Specimens from Fort Whipple, summer of 1865.

I ascertained the occurrence in the Territory of two other species of turtles, specimens of which were among a small part of my collections, which unfortunately was lost. One of these was procured on the Colorado Chiquito River in July, 1864; it was about eight inches long. Another entirely different species was found to be common in the headwaters of the San Francisco River, near Fort Whipple, where several specimens were secured with hook and line in January, 1865. They were very voracious, being often drawn out of the water and taken in hand before they would relinquish their hold, although not fastened upon the hook. These were of small size, about four inches in length. (One of these species may have been *Chrysemys oregonensis*.)

The two following species are introduced in the present connection on the authority of Professor Baird's Report on the *Reptilia* of the Mexican Boundary Survey:—

2. *Cinosternum sonoriense*, LeC.

Kinosternon sonoriense, LEC., Proc. Acad. Nat. Sci. Phila., 1854, 184.
Thyrosternum sonoriense, AGASS., Contrib. Nat. Hist. U. S., i, 1857, 428, pl. 5, figs. 8-11.—BD., U. S. & Mex. Bound. Surv., ii, pt. ii, 1859, Reptiles, 3.
Cinosternum sonoriense, COPE, Check-List, 1875, 52.

"Tucson and Guadeloupe Cañon, *Kennerly*."

This species was originally described from Tucson, "Sonora" (*i. e.*, Arizona).

3. *Cinosternum flavescens*, (*Agass.*).

PLATE XVII, FIGS. 1, 2, 3.

Platythyra flavescens, AGASS., Contrib. Nat. Hist. U. S., i, 1857, 430, pl. 5, figs. 12-15.—

BD., U. S. & Mex. Bound. Surv., ii, pt. ii, 1859, Reptiles, 3.

Cinosternum flavescens, COPE, Check-List, 1875, 52.

"Arkansas, Texas, and valley of the Gila."

The plate affords views of profile, dorsum and abdomen of the species.

3bis. *Cinosternum henrici*, *LeC.*

PLATE XVI.

Kinosternum henrici, LEC., Proc. Acad. Nat. Sci. Phila., 1854, 182.

Cinosternum henrici, COPE, Check-List, 1875, 52.

Obtained in Arizona by the Explorations West of the One-hundredth Meridian; see Dr. Yarrow's Report, *anteà*.

SAURIA

NYCTISAURIA.

GECCONIDAE.

4. *Coleonyx variegatus*, (*Bd.*) *Cope*.

Stenodactylus variegatus, BD., Proc. Acad. Nat. Sci. Phila., Dec., 1858, 254.—*Id.*, U. S. & Mex. Bound. Surv., ii, pt. ii, 1859, Reptiles, 12, pl. 23, figs. 9-27, pl. 24, figs. 11-19.

Coleonyx variegatus, COPE, Proc. Acad. Nat. Sci. Phila., 1866, 310.—*Id.*, *ib.*, 1867, 85 (Owen's Valley, Cal.).—*Id.*, Check-List, 1875, 50.

"Colorado Desert, *A. Schott*."

Head very broad; hind foot contained six times in head and body; above brownish-yellow, with irregular, small blotches of light reddish-brown, sometimes in broad transverse bands; edges of eyelids and whole under surface opaque white.—(*Descr. orig.*)

5. *Phyllodactylus tuberculosus*, *Wieg.*

Phyllodactylus tuberculosus, WIEGM., Nova Act. K. Leop.-Car. Acad., xvii, 241.—BD., U. S. & Mex. Bound. Surv., ii, pt. ii, 1859, Reptiles, 12, pl. 23, figs. 1-8 (Durango, Mex.).—COPE, Check-List, 1875, 52.

A species of the Sonoran region, not observed by me.

PLEURODONTA.

IGUANIA.

IGUANIDAE.

6. *Phrynosoma douglassi*, (Bell) Gray.

a. DOUGLASSI.

Agama douglassii, BELL, Trans. Linn. Soc., xvi, 1828 (1833), 105, pl. 10.—HARLAN, Med. & Phys. Res., 1835, 141, f. 3.

Phrynosoma douglassii, GRAY, Griffith's An. King., ix, 1831, 44.—WAGL., Nat. Syst. Amphib., 1830, 146.—WIEGM., Herp. Mex., 1834, 54.—HOLB., N. A. Herp., i, 1842, 101, pl. 14.—DE KAY, Zoöl. N. Y., 1842, 31.—GRAY, Cat. Brit. Mus., 1845, 227.—GIR., Stans. Rep. Exp. Great Salt Lake, 1852, 362, pl. 7, figs. 6-9. COPE, Proc. Acad. Nat. Sci. Phila., 1866, 302.—ALLEN, Proc. Bost. Soc. Nat. Hist., xvii, 1874, 69.—COPE, Check-List, 1875, 49.

Tapaya douglassii, GIR., Herp. U. S. Exp. Exped., 1858, 398, pl. 21, figs. 1-5.—BD., P. R. R. Rep., x, 1859, Gunnison's & Beckwith's Route, Reptiles, 18.—*Id.*, P. R. R. Rep., x, 1859, Williamson's & Abbott's Route, Reptiles, 9.—COOP. & SUCKL., Nat. Hist. Wash. Terr., 1860, 294.

Tapaya brevirostris, GIR., U. S. Exp. Exped., 158, 377.—BD., P. R. R. Rep., x, 1859, Gunnison's & Beckwith's Route, Reptiles, 18.

Phrynosoma brevirostris, COPE, Proc. Acad. Nat. Sci. Phila., 1866, 302.

b. ORNATISSIMUM.

Phrynosoma orbiculare, HALLOW., Sitgreave's Exp. Zuñi & Col. Riv., 125, pls. 8, 9 (not of Wiegmann).

Tapaya ornatissima, GIR., U. S. Exp. Exped. Herp., 1858, 396.—BD., P. R. R. Rep., x, 1859, Whipple's Route, Reptiles, 38.—*Id.*, U. S. & Mex. Bound. Surv., ii, pt. ii, 1859, Reptiles, 9.

Phrynosoma douglassii, subsp. *ornatissimum*, COPE, Check-List, 1875, 49.

Numerous specimens in my collection, from various parts of New Mexico and Arizona. One of them, No. 407,* from Bero Springs, N. Mex., between Fort Wingate and the Rio Grande, was formerly identified by Professor Cope with *P. brevirostre*, which, however, appears to be not a tenable species.

This round bodied and plain looking species, with the cephalic spines rudimentary, exhibits a wide range of variation in color. Some specimens are uniform brown above; others have dark cross bars, with light hinder edges, or dark oval spots, yellow-margined or not; in some the spines and

* Numbers of specimens throughout this article refer to my field-register.

sides of the head are quite red. The under parts vary from a plain dull grayish-white to close nebulation with numerous squarish dusky spots. The young are generally very light colored and more uniform than the adults, a plain reddish or grayish brown prevailing on the upper parts. The orbicular shape of the body appears constant, but there is a great difference in the length of the tail and its thickness at the base. It varies from nearly half to considerably less than half the total length (contained $1\frac{3}{4}$ to $2\frac{3}{8}$ times in the total length). Specimens from the Colorado Chiquito River are conspicuous by the yellow edging of the oval brown dorsal spots.

This is the most widely distributed species of the genus *Phrynosoma* (including *Tapaya* and *Doliosaurus*) in the United States, and one of the most abundant. I have recently ascertained its extension to British America in the region of the Milk River, where it is a common animal. In these higher latitudes, its dispersion seems strictly coincident with that of *Caudisoma confluenta*. In New Mexico and Arizona, it is the characteristic species. I found it abundant at all points on my journey from Santa Fé, N. Mex., to Fort Whipple, Ariz., and constantly met with it in various other parts of the last named Territory.

Like other species of the same genus, this *Phrynosoma* is slow of foot and readily captured by hand; it makes an interesting pet to one fond of observing the traits of lower animals. It may readily be secured by a thread tied behind the "horns"; and in this state of partial liberty its habits may be studied to advantage. It is one of the most inoffensive and amiable of reptiles; though some of the largest and boldest individuals sometimes make a slight demonstration in self-defense by biting weakly, it usually submits at once without remonstrance. When handled, it has a way of making itself perfectly flat, when, closing its eyes, it will simulate death in this collapsed state. Under some circumstances, it will swell up the body prodigiously till it assumes a nearly spherical shape. It has a sly way of watching for a chance to escape by bolting away when it thinks itself unobserved, and a still more curious knack of burying itself in sand or other loose soil. This is accomplished by a gradual lateral and forward insinuating wriggling of the body, with the muzzle pointed downward and the limbs drawn close to the sides. A few moments suffice for its disap-

pearance. A certain slight means of defense which the "horns" may sometimes afford is shown by the use they are put to when the animal is irritated by poking with a finger or bit of a stick; then the head is lowered, the horns set forward, the back arched up, and the whole attitude becomes ludicrously like that of a bull in miniature. The Horned Lizards show special aversion to dogs; on the approach of one, they raise themselves to the full length of the legs, puff out the body, open the mouth, and hiss audibly, altogether presenting quite a formidable front. Their food, in confinement and otherwise, consists chiefly of flies and other insects, which they capture by a quick thrust of the fleshy tongue, lubricated with viscid saliva. I have not observed the time of coition, nor the period of gestation; but most of the females are found pregnant in July, and the young appear in great numbers in August. The male is usually smaller than the female, and of slenderer form.

7. *Phrynosoma regale*, Gir.

Phrynosoma regale, GIR., Herp. U. S. Exp. Exped., 1858, 406.—BD., U. S. & Mex. Bound. Surv., ii, pt. ii, 1859, Reptiles, 9, pl. 28, figs. 1-3.—COPE, Proc. Acad. Nat. Sci. Phila., 1866, 310.—*Id.*, Check-List, 1875, 49.

"*Phrynosoma golaris*, GRAY, Cat. Sauria Brit. Mus., 229."

This large species, not noted by me, appears to inhabit more particularly the desert portions of the Territory in the valleys of the Gila and Colorado.

8. *Phrynosoma maccalli*, (Hallow.) Cope.

Anota McCalli, HALLOW., Sitgreave's Exp. Zuñi & Col. Riv., 1853, 127, pl. 10, (type of genus).

Doliosaurus m'callii, GIR., Herp. U. S. Exp. Exped., 1858, 400.—BD. U. S. & Mex. Bound. Surv., ii, pt. ii, 1859, Reptiles, 9, pl. 28, figs. 4-6.

Phrynosoma maccalli, COPE, Proc. Acad. Nat. Sci. Phila., 1866, 310.—*Id.*, Check-List, 1875, 49.

From the same region as the last, and, like it, not noticed by me.

9. *Phrynosoma planiceps*, Hallow.

PLATE XXIV, fig. 1a, 1b.

Phrynosoma planiceps, HALLOW, Proc. Acad. Nat. Sci. Phila., 1852, 178.—COPE, Check-List, 1875, 49.

This species has been added to the fauna of the Territory by Dr. H. C. Yarrow since the present paper was drawn up.

10. *Phrynosoma platyrhinum*, Gir.

Phrynosoma platyrhinos, GIR., Stans. Rep. Exp. Great Salt Lake, 361, 363, pl. 7, figs.

1-5.—COPE, Proc. Acad. Nat. Sci. Phila., 1866, 302.

Phrynosoma platyrhinum, COPE, Check-List, 1875, 49.

Doliosaurus platyrhinos, GIR., Herp. U. S. Exp. Exped., 1858, 407.—BD., P. R. R. Rep., x, 1859, Gunnison's & Beckwith's Route, Reptiles, 18.

Specimens in my collection from Arizona, or a contiguous portion of New Mexico, but without indication of precise locality.

11. *Phrynosoma modestum*, Gir.

Phrynosoma modestum, GIR., Stans. Rep. Exp. Great Salt Lake, 1853, 361, 365, pl. 6, figs. 4-8.—COPE, Proc. Acad. Nat. Sci. Phila., 1866, 302.—*Id.*, Check-List, 1875, 49.

Doliosaurus modestus, GIR., Herp. U. S. Exp. Exped., 1853, 409.—BD., U. S. & Mex. Bound. Surv., ii, pt. ii, 1859, Reptiles, 10.—*Id.*, P. R. R. Rep., x, 1859, Whipple's Route, Reptiles, 38.

Bero Springs, June, 1864, one specimen of this small and inconspicuous species.

12. *Sceloporus consobrinus*, Bd. & Gir.

Sceloporus consobrinus, BD. & GIR., Marcy's Rep. Exp. Red Riv., 1853, 224, pl. 10, figs. 5-12.—BD., P. R. R. Rep., x, 1859, Whipple's Route, Reptiles, 37.—*Id.*, U. S. & Mex. Bound. Surv., ii, pt. ii, 1859, Reptiles, 5.—HAYD., Trans. Am. Phil. Soc., xii, 1862, 177.—COPE, Proc. Acad. Nat. Sci. Phila., 1866, 303.—ALLEN, Proc. Bost. Soc. Nat. Hist., xvii, 1874, 69.—COPE, Check-List, 1875, 49.

A wide ranging species in the West, whose habitat, as now known, extends north to the Yellowstone, where it was lately discovered by Mr. J. A. Allen, and to Oregon. I found it in various parts of Arizona, not only in the southern desert portions where reptiles most abound, but also in the pine covered mountainous tracts, as about Fort Whipple, for instance, where it was a common inhabitant of the high dry woods, with *Cnemidophorus gularis*.

13. *Sceloporus clarki*, Bd. & Gir.

PLATE XXIII, FIG. 1 (var.).

a. CLARKI.

Sceloporus clarkii, BD. & GIR., Proc. Acad. Nat. Sci. Phila., 1862, 127.—BD., U. S. & Mex. Bound. Surv., ii, pt. ii, 1859, Reptiles, 5.—COPE, Proc. Acad. Nat. Sci. Phila., 1866, 310.—*Id.*, Check-List, 1875, 49.

Sceloporus magister, HALLOW., Proc. Acad. Nat. Sci. Phila., 1854, 93.

b. ZOSTEROMUS.

Sceloporus zosteromus, COPE, Proc. Acad. Nat. Sci. Phila., 1863, 105 (Lower California).
Sceloporus clarkii, subsp. *zosteromus*, COPE, Check-List, 1875, 49.

Judging from the citations of numerous specimens from various localities in the Report of the Mexican Boundary Survey, this species is common along the southern border of the United States. It was not met with by me. Var *zosteromus* is the Lower California form.

14. *Sceloporus poinsetti*, Bd. & Gir.

Sceloporus poinsettii, BD. & GIR., Proc. Acad. Nat. Sci. Phila., 1852, 126.—BD., U. S. & Mex. Bound. Surv., ii, pt. ii, 1859, Reptiles, 5, pl. 29, figs. 1-3.—COPE, Check-List, 1875, 48.

Quoted from "Sonora" in the Mexican Boundary Report. Obtained in Northern Arizona by Mr. H. W. Henshaw.

15. *Sceloporus scalaris*, Wiegman.

Sceloporus scalaris, WIEGM., Herp. Mex., 1834, 52, pl. 8, f. 2.—BD., U. S. & Mex. Bound. Surv., ii, pt. ii, 1859, 6.—COPE, Check-List, 1875, 49.

Los Nogales, "Sonora."

16. *Sceloporus marmoratus*, Hallowell.

Sceloporus marmoratus, HALLOW., Proc. Acad. Nat. Sci. Phila., 1852, 178.—*Id.*, Sitgreave's Exp. Zuñi & Col. Riv., 1853, 110, pl. 2.—BD., U. S. & Mex. Bound. Surv., ii, pt. ii, 1859, Reptiles, 6.—COPE, Check-List, 1875, 48.

Sceloporus delicatissimus, HALLOW., Proc. Acad. Nat. Sci. Phila., 1852, 178.—*Id.*, Sitgreave's Exp. Zuñi & Col. Riv., 1853, 109, pl. 1.

Not observed by me. The known range of this species, however, extends from Utah into the Sonoran Region.

17. *Sceloporus torquatus*, Peale & Green.

Sceloporus torquatus, PEALE & GREEN, Journ. Acad. Nat. Sci. Phila., ii, —, 131.—COPE, Check-List, 1875, 48 (quotes "Proc. Acad." by error for Journ. Acad.).

Quoted by Professor Cope from the Sonoran Region.

18. *Sceloporus yarrowi*, Cope.

PLATE XXIII, FIGS. 2, 2b, 2c, 2d.

Sceloporus jarrovi, COPE, Zoöl. Expl. W. 100th Merid., anteà, p. 569.—COPE, Check-List, 1875, 48. (N. B. The "Check-List" is published during the passage of the present volume through the press.)

From Southern Arizona, *Mr. H. W. Henshaw*.

An account of this fine new species, appropriately dedicated to the zoölogist of the Explorations west of the one hundredth meridian, will be found on the preceding pages.

19. *Sceloporus graciosus*, *Bd. & Gir.*

Sceloporus graciosus, *BD. & GIR.*, Proc. Acad. Nat. Sci. Phila., 1852, 69.—*Id.*, Stans. Rep. Exp. Great Salt Lake, 346, pl. 5, figs. 1-3.—*BD.*, P. R. R. Rep., x, 1859, Gunnison's & Beckwith's Route, Reptiles, 17.—*Id.*, P. R. R. Rep., x, 1859, Williamson's & Abbott's Route, Reptiles, 9.—*COOP. & SUCKL.*, Nat. Hist. Wash. Terr., 1860, 294.—*HAYD.*, Trans. Am. Phil. Soc., xii, 1862, 177.—*COPE*, Proc. Acad. Nat. Sci. Phila., 1866, 303.

Sceloporus gracilis, *BD. & GIR.*, Proc. Acad. Nat. Sci. Phila., 1852, 175.—*GIR.*, U. S. Exp. Exped., 1858, 386, pl. 20, figs. 1-9.

Observed at Navajo Springs, near the eastern border of the Territory, and along the Colorado Chiquito River in sandy situations.

Like the last, the present species is a wide ranging one, having been obtained by Dr. Suckley at The Dalles of the Columbia, or at Steilacoom. This gentleman found it living in the crevices of basaltic rocks, and notices variations in color, according to the situation frequented, like those below mentioned in the case of *Uta symmetrica*.

20. *Uta graciola*, (*Hallow.*) *Bd.*

Uro-saurus graciosus, *HALLOW.*, Proc. Acad. Nat. Sci. Phila., vii, 1854, 92.—*Id.*, P. R. R. Rep., x, 1859, Williamson's Route, Reptiles, 4.

Uta graciola, *BD.*, U. S. & Mex. Bound. Surv., ii, pt. ii, 1859, Reptiles, 7.—*COPE*, Proc. Acad. Nat. Sci. Phila., 1866, 310.—*Id.*, Check-List, 1875, 48.

In referring this species, originally described as a *Urosaurus*, to the genus *Uta*, Professor Baird quotes specimens from the Colorado River, collected by Mr. Arthur Schott. It was not observed by me.

21. *Uta stansburiana*, *Bd. & Gir.*

Uta stansburiana, *BD. & GIR.*, Proc. Acad. Nat. Sci. Phila., vi, 1852, 69.—*Id.*, Stans. Rep. Exp. Great Salt Lake, 345, pl. 5, figs. 4-6.—*BD.*, U. S. & Mex. Bound. Surv., ii, pt. ii, 1859, Reptiles, 7.—*Id.*, P. R. R. Reptiles, x, 1859, Whipple's Route, Reptiles, 37.—*COPE*, Check-List, 1875, 48.

Originally described from the valley of the Great Salt Lake, where specimens were secured by Capt. Howard Stansbury, this species has since been ascertained to inhabit Texas, New Mexico, and Arizona. It was

taken in the desert of the Gila by Mr. Arthur Schott. No specimens are contained in my collections.

22. *Uta ornata*, Bd. & Gir.

Uta ornata, BD. & GIR., Proc. Acad. Nat. Sci. Phila., 1852, 126.—BD., U. S. & Mex. Bound. Surv., ii, pt. ii, 1859, Reptiles, 7.—COPE, Check.List, 1875, 48.

Uta ornata var. *linearis*, BD., l. c. (Los Nogales).

Obtained by the naturalists of the United States and Mexican Boundary Survey at various points along the line, and therefore properly to be included in the present connection.

? *Uta symmetrica*, Bd. (= *ornata* ?)

Uta symmetrica, BD., Proc. Acad. Nat. Sci. Phila., 1858, p. —.—*Id.*, U. S. & Mex. Bound. Surv., ii, pt. ii, 1859, Reptiles, 7.—COPE, Proc. Acad. Nat. Sci. Phila., 1866, 303.

"Larger dorsal scales in four regular series, two on either side of the median smaller ones; head short, depressed, one and a half times as wide as deep; tail one and a half times the head and body; general color light-brown above, the belly white; sides with broad transverse bands of blackish; size of *U. ornata*. Gila River."—(*Baird.*)

The above description may be supplemented with a statement of the great variation in coloration during life of different specimens, as observed by me. This variation, which I have no reason to presume to be confined to the present species of the genus, is mainly dependent upon the character of the rocks which the animals frequent. Out of great numbers of specimens procured in one locality, namely, Bero Springs, near Fort Wingate, N. Mex., and unquestionably the same species, almost the only color mark common to all was the pale yellow throat. Some were plain silvery-white below, others were bright greenish-olive on the belly. Above, the color ranges from a deep grayish-black, to a dull grayish-brown with dark lateral streak. I satisfied myself that the same individual assumed these different colors according to the kind of rocks it happened to be upon. The blackish specimens were invariably found upon dark lava rocks, the lighter ones upon yellowish sandstone. We have here an interesting case of protective assimilation. The same thing has been noted by Dr. H. C. Yarrow, as this gentleman informs me, in other cases, and it is doubtless of more general occurrence than has been fully recognized by naturalists. The common Fence

Lizard of the Eastern States (*Sceloporus undulatus*) exhibits corresponding changes in color.

This species is very abundant in certain rocky places. Like others of the genus, it is difficult to secure without mutilation, on account of its extreme agility and the fragility of the tail. Specimens may be best obtained by switching them off the rocks with a light rod drawn rapidly along the surface.

23. *Crotaphytus collaris*, (Say) Holbr.

Agama collaris, SAY, Long's Exped. Rocky Mts., ii, 1823, 252.—HARLAN, Med. & Phys. Res., 1835, 142.

Crotaphytus collaris, HOLBR., N. A. Herp., ii, 1842, 79, pl. 10.—BD. & GIR., Marcy's Rep. Exp. Red Riv., 1853, 222.—BD., U. S. & Mex. Bound. Surv., ii, pt. ii, 1859, Reptiles, 6.—*Id.*, P. R. R. Rep., x, 1859, Gunnison's & Beckwith's Route, Reptiles, 19, pl. 24, figs. 1a-e.—*Id.*, *ib.*, Whipple's Route, Reptiles, 38.—COPE, Proc. Acad. Nat. Sci. Phila., 1866, 302.—*Id.*, Check-List, 1875, 47.

A long and well known species of striking characters, type of the genus, and of very general distribution in the Southwest. It was observed by me in New Mexico and Arizona at various points from the crossing of the Rio Grande at Los Pinos to the Colorado Chiquito River, where it was particularly abundant, on dry, sandy soil among fallen timber, in brush-heaps, &c. It was not noted at Fort Whipple, and probably does not occur in the coniferous mountainous portions of the Territory.

The length of this species, as commonly observed, is eleven or twelve inches. The colors in life, when the animal is in full vigor, are strikingly rich and varied; they fade noticeably before death when the creatures fret and pine in captivity, and certainly no description taken from alcoholic specimens, even comparatively fresh, conveys an accurate idea of the richness of the tints. The throat is loose and dilatable, and the animal has a habit of puffing it out when hissing under irritation or in anger.

This lizard is one of the more agile species of its group, though not so remarkably swift-footed as some of the *Cnemidophori*, and is difficult to capture alive without injury. It is one of the boldest, fiercest, and most irascible of its kind; those that I kept in confinement proved entirely untamable. They not only defended themselves with spirit and vigor by

biting when handled or irritated, but sometimes assumed the offensive, leaping to attack to the full length of the cord which confined them. Their behavior was in striking contrast to that of the Horned Frogs picketed with them. The lizards lay sullen, but not cowed, watching every movement of the persons around them with glittering eyes, ready to spring upon an intruder without warning. They clung tenaciously to a stick or the finger, in which they might fix their teeth, and suffered themselves to be suspended in this manner for some time before relinquishing hold. Now and then they seemed to have fits of ungovernable rage, during which they leaped aimlessly about, and tugged persistently at the cord. They refused to eat, apparently from pure chagrin, and all died within a few days.

24. *Crotaphytus wislizeni*, *Bd. & Gir.*

Crotaphytus wislizenii, BD. & GIR., Proc. Acad. Nat. Sci. Phila., 1852, 69.—*Id.*, Stans. Rep. Exp. Great Salt Lake, 1852, 340, pl. 3.—BD., U. S. & Mex. Bound. Surv., ii, pt. ii, 1859, Reptiles, 7, pl. 31.—*Id.*, P. R. R. Rep., x, 1859, Gunnison & Beckwith's Route, Reptiles, 17.—*Id.*, *ib.*, x, 1859, Whipple's Route, Reptiles, 37.—COOP. & SUCKL., Nat. Hist. Wash. Terr., 1860, 294.—COPE, Proc. Acad. Nat. Sci. Phila., 1866, 303.—COPE, Check-List, 1875, 48.

Crotaphytus (Gambelia) wislizenii, BD., U. S. & Mex. Bound. Surv., *loc. cit.*, in text.

Crotaphytus gambeli, BD. & GIR., Proc. Acad. Nat. Sci. Phila., 1852, 126.

Crotaphytus fasciatus, HALLOW., Proc. Acad. Nat. Sci. Phila., 1852, 207.—*Id.*, Sitgreave's Exp. Zuñi & Col. Riv., 1853, 115, pl. 5.

This species, very distinct from the last, and only less beautiful, was found associated with it along the Colorado Chiquito River, where, however, it was less abundant. Its habits and traits appear to be much the same. Its distribution in the West is general, in suitable localities, the species being found as far north as The Dalles in Oregon.

25. *Crotaphytus reticulatus*, *Bd.*

Crotaphytus reticulatus, BD., Proc. Acad. Nat. Sci. Phila., 1858, 253 (West Texas).—COPE, Check-List, 1875, 48.

This species, originally described from Western Texas, has been recently added to the fauna of the Territory by the Explorations West of the One-hundredth Meridian.—(See Dr. Yarrow's report, *anteà*.)

26. *Dipsosaurus dorsalis*, (*Bd. & Gir.*) *Hallow.*

Crotaphytus dorsalis, BD. & GIR., Proc. Acad. Nat. Sci. Phila., vi, 1852, 126.—BD., U. S. & Mex. Bound. Surv., ii, pt. ii, 1859, Reptiles, 8, pl. 32, figs. 7-13.

Dipsosaurus dorsalis, HALLOW., Proc. Acad. Nat. Sci. Phila., vii, 1854, 92.—COPE, Proc. Acad. Nat. Sci. Phila., 1866, 310.—*Id.*, Check-List, 1875, 48.

From the Colorado Desert. Not noted by me.

27. *Callisaurus draconoides ventralis*, (Hallow.) Bd.

b. VENTRALIS.

Homalosaurus ventralis, HALLOW., Proc. Acad. Nat. Sci. Phila., vi, 1852, 179.—*Id.*, Sitgreave's Exp. Zuñi & Col. Riv., 1854, 117, pl. 6.

Callisaurus ventralis, BD., U. S. & Mex. Bound. Surv., ii, pt. ii, 1859, Reptiles, 8.

Callisaurus draconoides subsp. *ventralis*, COPE, Check List, 1875, 47.

Like the last, from the southern desert portions of the Territory, and not observed by me. *Callisaurus* var. *gabbi* (Cope, Check-List, 47) is a form from Owen's Valley, California, likely to be found in Arizona.

28. *Sauromalus ater*, Duméril.

Sauromalus ater, "DUM., Arch. du Mus."—COPE, Check-List, 1875, 47.

Euphryne obesa, BD., Proc. Acad. Nat. Sci. Phila., 1858, p. —.—*Id.*, U. S. & Mex. Bound. Surv., ii, pt. ii, 1859, 6, pl. 27.—COPE, Proc. Acad. Nat. Sci. Phila., 1866, 310.

Fort Yuma.

29. *Uma notata*, BD.

Uma notata, BD., Proc. Acad. Nat. Sci. Phila., 1858, 253 (Mojave Desert, Heermann).—COPE, Check-List, 1875, 47.

Ears distinct; a very long infraorbital plate; palate without teeth; outer face of upper labials plane and broadly vertical; the labials themselves much imbricated and very oblique; scales of body above equal, much smaller than ventral ones; interorbital space with two series of plates; claws very long, slender, and straight; sides with a round black spot.

Head about two-fifths the head and body; above light pea-green, spotted with darker green; beneath white; head and body about two inches long.—(*Descr. orig. gen. et sp.*)

Fort Buchanan, Ariz., Dr. B. J. D. Irwin, U. S. A. Originally described from the Mojave Desert.

30. *Holbrookia texana*, (Trosch.) Bd. & Gir.

Coposaurus texanus, TROSCH., Archiv f. Naturg. for 1850 (1852), 389, pl. 6.

Holbrookia texana, BD. & GIR., Proc. Acad. Nat. Sci. Phila., vi, 1852, 125.—BD., U. S. & Mex. Bound. Surv., ii, pt. ii, 1859, Reptiles, 8, pl. 30.—*Id.*, P. R. R. Rep., x, 1859, Whipple's Route, Reptiles, 38.—COPE, Proc. Acad. Nat. Sci. Phila., 1866, 303.—*Id.*, Check-List, 1875, 47.

Holbrookia approximans, BD.

Originally described from Texas, and subsequently found in Arizona by Mr. Arthur Schott and myself. The specimens do not retain indication of precise locality.

31. *Holbrookia maculata*, Gir.

Holbrookia maculata, GIR., Proc. Am. Assoc., iv, 1850 (1851), 201.—*Id.*, Stans. Exp. Great Salt Lake, 1852, 342, pl. 6, figs. 1-3.—*Id.*, Marcy's Rep. Exp. Red. Riv., 1852, 223.—BD., U. S. & Mex. Bound. Surv., ii, pt. ii, 1859, Reptiles, 8.—*Id.*, P. R. R. Rep., x, 1859, Gunnison's & Beckwith's Route, Reptiles, 18.—*Id.*, *ib.*, x, 1859, Whipple's Route, Reptiles, 38.—HAYD., Trans. Am. Phil. Soc., xii, 1862, 177.—COPE, Proc. Acad. Nat. Sci. Phila., 1866, 303.—*Id.*, Check-List, 1875, 47.

Holbrookia affinis, BD. & GIR., Proc. Acad. Nat. Sci. Phila., vi, 1852, 125.—BD., U. S. & Mex. Bound. Surv., ii, pt. ii, 1859, Reptiles, 8.

A species of general distribution in the southwest, along the Arkansas, Red, Canadian, and Platte Rivers, in Utah, Texas, New Mexico, and Arizona, as may be gathered from the foregoing references, and in some places extremely abundant. My specimens are from Fort Whipple, where the animal is common.

31a. *Holbrookia maculata propinqua*, Bd. & Gir.

Holbrookia propinqua, BD. & GIR., Proc. Acad. Nat. Sci. Phila., vi, 1852, 126.—BD., U. S. & Mex. Bound. Surv., ii, pt. ii, 1859, Reptiles, 8.—COPE, Proc. Acad. Nat. Sci. Phila., 1866, 303.

Numerous specimens, identified with this form by Professor Cope, are represented in my collections, from various points along my line of march, both in New Mexico and Arizona. It is perhaps the most abundant and generally distributed representative of the genus in the latter Territory. The earlier indications are from Texas.

DIPLOGLOSSA.

HELODERMATIDAE.

32. *Heloderma suspectum*, Cope.

Heloderma horridum, BD., U. S. & Mex. Bound. Surv., ii, pt. ii, 1859, Reptiles, 11, pl. 26 (not of WIEGM., Isis, 1829, 627, and Herp. Mex., 1834).—*Id.*, P. R. R. Rep., x, 1859, Whipple's Route, Reptiles, 38.—COPE, Proc. Acad. Nat. Sci. Phila., 1866, 303.

Heloderma suspectum, COPE, Check-List N. A. Batrach. & Rept., 1875, 47.—YARROW, Zool. Expl. W. 100th Merid., *antea*.

Loss of the label from the specimen in my collection, noted by Pro-

fessor Cope as above, led to an erroneous assignment of Fort Whipple as the locality. The specimen was taken in the desert in the vicinity of La Paz on the Colorado River, and I am confident it does not occur in the higher mountainous parts of the Territory.

The "Gila Monster", as this large and repulsive looking reptile is called, appears to be not uncommon in the hot, southern parts of the Territory. A poisonous property is attributed to its saliva by the Mexicans, with whom the belief is also prevalent that it has the power of spiriting its supposed venom. The females of the same ignorant people have a superstitious belief in the influence that this and some other Saurians may exercise over certain periodical functions of their sex. I am informed by Dr. H. C. Yarrow that in some localities they attribute to *Amblystoma* a miraculous power of causing conception—a form of superstition doubtless found convenient at times, especially if shared by their male relatives.

GERRHONOTIDAE.

33. *Gerrhonotus nobilis*, Bd. & Gir.

Elgaria nobilis, BD. & GIR., Proc. Acad. Nat. Sci. Phila., 1852, 129.

Gerrhonotus nobilis, BD., U. S. & Mex. Bound. Surv., ii, pt. ii, 1859, 11, pl. 25, figs. 1-8.—COPE, Check-List, 1875, 47.

From the copper-mines of "New Mexico" (*i. e.*, Arizona).

G. infernalis is a species from Western Texas, which may yet be found to inhabit Arizona. (COPE, Proc. Nat. Sci. Acad., Phila., 1866, 322; Check-List, 1875, 47.)

LEPTOGLOSSA.

TEIIDAE.

34. *Cnemidophorus sexlineatus gularis*, (Bd. & Gir.).

b. GULARIS.

Cnemidophorus gularis, BD. & GIR., Proc. Acad. Nat. Sci. Phila., vi, 1852, 128.—BD. & GIR., Marcy's Rep. Exp. Exped. Red Riv., 1852, 227, pl. 10, figs. 1-4.—BD., U. S. & Mex. Bound. Surv., ii, pt. ii, 1859, Reptiles, 11, pl. 34, figs. 1-6.—*Id.*, P. R. R. Rep., x, 1859, Whipple's Route, Reptiles, 38.

Cnemidophorus sexlineatus var. *gularis*, COPE, Proc. Acad. Nat. Sci. Phila., 1866, 303.
Cnemidophorus guttatus, HALLOW., Proc. Acad. Nat. Sci. Phila., 1854, 192.—*Id.*, P. R.
 R. Rep., x, 1859, Parke's Route, Reptiles, 23.

Numerous specimens in my collection, from various localities nearly throughout Arizona, where it is abundant. At Fort Whipple, it is the most numerous and characteristic species. It lives in the high dry pine and oak woods, about bushes, brush-heaps, stumps, logs, &c.; but I never saw it on rocks, nor knew it to ascend the trunks of standing trees. It used to frequently enter our tents during the summer, and hunt for flies in a quiet, furtive manner, catching them with great address, and was very favorably regarded by all on this account, though its labors resulted in no sensible diminution of the pests. Though thus familiar, it is an exceedingly timorous animal, and darts out of sight upon the least alarm. It is one of the very swiftest of its agile tribe—the eye can scarcely follow it when running at its best on level ground.

35. *Cnemidophorus grahami*, *Bd. & Gir.*

Cnemidophorus grahami, BD. & GIR., Proc. Acad. Nat. Sci. Phila., 1852, 128.—BD., U.
 S. & Mex. Bound. Surv., ii, pt. ii, 1859, Reptiles, 10, pl. 32, figs. 1-6.—COPE,
 Check-List, 1875, 45.

"Los Nogales, *Kennerly*."

36. *Cnemidophorus perplexus*, *Bd. & Gir.*

Cnemidophorus perplexus, BD. & GIR., Proc. Acad. Nat. Sci. Phila., 1852, 128.—BD.,
 U. S. & Mex. Bound. Surv., ii, pt. ii, 1859, Reptiles, 10.—COPE, Check-List,
 1875, 46.

"Tucson, Arizona, *Kennerly*."

37. *Cnemidophorus tessellatus gracilis*, (*Bd. & Gir.*).

Cnemidophorus gracilis, BD. & GIR., Proc. Acad. Nat. Sci. Phila., 1852, 128.—BD., U.
 S. & Mex. Bound. Surv., ii, pt. ii, 1859, Reptiles, 10, pl. 34, figs. 7-14.—COPE,
 Proc. Acad. Nat. Sci. Phila., 1866, 310.

Cnemidophorus tessellatus subsp. *gracilis*, COPE, Check-List, 1875, 46.

Indicated as occurring in this region in Professor Cope's enumeration of species additional to those contained in my collections.

37a. *Cnemidophorus tessellatus melanostethus*, *Cope*.

Cnemidophorus melanostethus, COPE, Proc. Acad. Nat. Sci. Phila., 1863, 104.

Cnemidophorus tessellatus subsp. *melanostethus*, COPE, Check-List, 1875, 46.

From southeastern portions of Arizona.

37b. *Cnemidophorus tessellatus tigris*, (Bd. & Gir.).

Cnemidophorus tigris, BD. & GIR., Proc. Acad. Nat. Sci. Phila., 1852, 69.—*Id.*, Stans. Rep. Exp. Great Salt Lake, 1853, 338.—BD., U. S. & Mex. Bound. Surv., ii, pt. ii, 1859, Reptiles, 10, pl. 33.

? *Cnemidophorus marmoratus*, BD. & GIR., Proc. Acad. Nat. Sci. Phila., 1852, 128.

? *Cnemidophorus undulatus*, HALLOW., Proc. Acad. Nat. Sci. Phila., 1854, 94.—*Id.*, P. R. R. Rep., x, 1859, Williamson's Route, Reptiles, 8.

Utah and southward in the Sonoran region. The true *tessellatus* of Say, which splits into several conspecies, is indicated by authors from Colorado.

SCINCIDAE.

38. *Eumeces obsoletus*, (Bd. & Gir.) Cope.

Plestiodon obsoletum, BD. & GIR., Proc. Acad. Nat. Sci. Phila., 1852, 129.—HALLOW., Sitgreave's Exp. Zuñi & Col. Riv., 1853, 111.

Plestiodon obsoletus, BD., U. S. & Mex. Bound. Surv., ii, pt. ii, 1859, Reptiles, pl. 25, figs. 9-16.—*Id.*, P. R. R. Rep., x, 1859, Whipple's Route, Reptiles, 39.

Plistodon obsoletus, COPE, Proc. Acad. Nat. Sci. Phila., 1866, 304.

Eumeces obsoletus, COPE, Check-List, 1875, 45.

The specimen, to which no locality is assigned in Professor Cope's article above cited, was taken at Bero Springs, N. Mex., from among some aquatic plants of a pool. It appeared sluggish, and was easily caught.

39. *Eumeces guttulatus*, (Hallow.) Cope.

Lamprosaurus guttulatus, HALLOW., Proc. Acad. Nat. Sci. Phila., 1852, 206.—*Id.*, Sitgreave's Exp. Zuñi & Col. Riv., 1853, 113, pl. 4.

Plestiodon guttulatus, HALLOW., Proc. Acad. Nat. Sci. Phila., 1857, 215.—BD., U. S. & Mex. Bound. Surv., ii, pt. ii, 1859, Reptiles, 12.—*Id.*, P. R. R. Rep., x, 1859, Whipple's Route, Reptiles, 18.

Plistodon guttulatus, COPE, Proc. Acad. Nat. Sci. Phila., 1866, 304.

Eumeces guttulatus, COPE, Check-List, 1875, 45.

From Fort Whipple, my collection.

OPHIDIA.

SOLENOGLYPHA.

CROTALIDAE.

40. *Caudisona confluenta*, (Say) Cope.

Crotalus confluentus, SAY, Long's Exped. Rocky Mts., ii, 1823, 48.—BD. & GIR., Cat. N. A. Rept., 1853, 8.—BD., P. R. R. Rep., x, 1859, Whipple's Route, Reptiles, 40, pl. 24, f. 4.—*Id.*, U. S. & Mex. Bound. Surv., ii, pt. ii, 1859, Reptiles, 14.—COOP. & SUCKL., Nat. Hist. Wash. Terr., 1860, 295, pl. 12.—COPE, Check-List, 1875, 33.

- Caudisona confluenta*, COPE, App. Mitchell's Researches, 1861, 122.—COPE, Proc. Acad. Nat. Sci. Phila., 1866, 307.—ALLEN, Proc. Bost. Soc. Nat. Hist., xvii, 1874, 307, 309.
- Crotalus lecontei*, HALLOW., Proc. Acad. Nat. Sci. Phila., vi, 1851, 180.—*Id.*, Sitgreave's Exp. Zuñi & Col. Riv., 1853, 139, pl. 18.—*Id.*, P. R. R. Rep., x, 1859, Williamson's Route, Reptiles, 18, pl. 3.—HEERM., *ibid.*, 25.
- Caudisona lecontei*, COPE, App. Mitchell's Res., 1861, 121.—HAYD., Trans. Am. Phil. Soc., xii, 1862, 177.
- Caudisona confluenta* var. *lecontei*, COPE, Proc. Acad. Nat. Sci. Phila., 1866, 307.
- Crotalus cinereous* (sic), LECONTE apud HALLOW., Sitgreave's Exp. Zuñi & Col. Riv., 1853, 140 (in text).

Examination of more material than that before Professor Cope in 1866 has failed to substantiate the distinctions sought to be maintained between *confluenta* and *lecontei*; and as the two forms do not appear to be geographically separated, there may be no necessity for their varietal recognition.

I have found this common and wide ranging species in various parts of the West, from the British possessions nearly to the Mexican border. At the North it is the only representative of its family, and one extremely abundant in some regions, as those of the Yellowstone, Upper Missouri, and Milk Rivers. In Arizona, where it is associated with several other species, it is not so abundant, nor is it the characteristic form. I found it only in the country about Prescott and on the San Francisco Mountains.

Specimens.

- No. 510. San Francisco Mountains, July, 1864.
- No. 572. Fort Whipple.
- No. 678. Fort Whipple; length 31 inches; stomach contained an adult *Sialia mexicana* (Bluebird).
- No. 801. San Francisco Mountains, at an altitude of about 10,000 feet.
41. *Caudisona molossus*, (Bd. & Gir.) Cope.
- Crotalus molossus*, BD. & GIR., Cat. N. A. Rept., 1853, 10 (New Mexico).—BD., U. S. & Mex. Bound. Surv., ii, pt. ii, 1859, Reptiles, 14, pl. 2.—*Id.*, P. R. R. Rep., x, 1859, Reptiles, pl. 24, f. 5 (no text).—COPE, Check-List, 1875, 45.
- Caudisona molossus*, COPE, Mitchell's Res., 1861, 124.—*Id.*, Proc. Acad. Nat. Sci. Phila., 1866, 307, 308.
- Crotalus ornatus*, HALLOW., Proc. Acad. Nat. Sci. Phila., vii, 1852, 192.—*Id.*, P. R. R. Rep., x, 1859, Parke's Route, Reptiles, 23, pl. 2.

Muzzle broad; rostral small; scales between superciliaries small, uni-

form, except the two anterior; two frontals; four post-frontals; two intersupercilia, all in contact; five rows of scales between labials and suborbital row; middle row not extending beyond the middle of the orbit; labials 18 above, fifth and sixth largest; 17 below; dorsal rows of scales 29; two external rows small; tail uniform black; color roll-sulphur, a series of chestnut-brown transverse lozenges, with exterior corners produced to the abdomen; centers of lozenges with one or two spots; each scale but one color; a brown patch below and behind the eye. "One of the most strongly marked of all the species" (*B. & G.*). Top of muzzle with three pairs of symmetrical shields; rattle parallelogrammic (*Cope*).

San Francisco Mountains, on dry, rocky ground, July, 1864.

42. *Caudisona lucifer*, (*Bd. & Gir.*) *Cope*.—Black Rattlesnake.

Crotalus lucifer, *BD. & GIR.*, Proc. Acad. Nat. Sci. Phila., vi, 1852, 177.—*Id.*, Cat. N. A. Rept., 1853, 6.—*GIR.*, U. S. Exp. Exped., 1858, 187, pl. 15, figs. 1-6.—*BD.*, P. R. R. Rep., x, 1859, Williamson's & Abbott's Route, Reptiles, 10, pl. 11.—*COOP. & SUCKL.*, Nat. Hist. Wash. Terr., 1860, 295.—*COPE*, Check-List, 1875, 33.

Caudisona lucifer, *COPE*, Mitchell's Res., 1861, 121.—*Id.*, Proc. Acad. Nat. Sci. Phila., 1866, 307, 309.

Head short, broad, and deep, with much rounded angles; snout less pointed than in *C. confluenta*. Labials 15-16 above and below; dorsal rows, 25. A dorsal series of brown blotches not margined with white; two small irregular lateral series on each side. Posteriorly, 15-20 half-rings, becoming blackish in old specimens. Light stripe from orbit below superciliary to angle of jaw above labials. Light stripe before eye expanding upon the whole of the upper labials and front and sides of face below crown and in front of orbits. Single light transverse line on superciliaries often obsolete. Rostral not edged with lighter.—(*Kennicott.*) Rattle parallelogrammic; rostral elevated, narrow, cuneiform; muzzle with two marginal shields above each canthus rostralis, and numerous small plates above.—(*Cope.*)

Originally described from Oregon, as above. This species was subsequently found in California, and later its range was shown to include Arizona by Dr. B. J. D. Irwin, U. S. A., and myself.

My numerous specimens from Arizona are nearly black, especially on the head, differing so decidedly from the Oregon type as to probably war-

rant varietal distinction of this southern form, which may be called *C. lucifer* var. *cerberus*.

Nos. 509, 511, and others, my collection, from the San Francisco Mountains, July, 1864.

This species was found associated with *C. confluenta* in Northern and Central Arizona, where it is abundant. The great size to which it attains, the caliber of the body, and black color combine to render it peculiarly repulsive. An unusual degree of virulence is attributed by backwoodsmen to the "Black Rattlesnake", but probably without foundation.

43. *Caudisona adamantea atrox* (Bd. & Gir).

Crotalus atrox, BD. & GIR., Cat. N. A. Rept., 1853, 5, 156.—BD., P. R. R. Rep., x, 1859, Whipple's Route, Reptiles, 39, pl. 24, f. 3.—*Id.*, U. S. & Mex. Bound. Surv., ii, pt. ii, 1859, Reptiles, 14, pl. 1.

Caudisona atrox, COPE, Mitchell's Res., 1861, 121.—COPE, Proc. Acad. Nat. Sci. Phila., 1866, 309.

Crotalus adamanteus, subsp. *atrox*, COPE, Check-List, 1875, 33.

Head subtriangular. Plates on head; 2 anterior frontals in contact; between these and superciliaries, on side of crown, 2 imbricated plates; space inclosed occupied by smaller scales; superciliaries bordered by a row of larger scales; the anterior much largest. Three rows of scales between labials and suborbitals. Labials 16 above, first, fifth, and seventh largest; 15 below, first and third largest; dorsal rows 25–27; 2 exterior rows smooth. On the tail 3–6 half-rings. Color yellowish-brown, with a continuous succession of dorsal lozenges, sometimes truncate before and behind; intervals all narrow. A single transverse light line on superciliary. Stripe from superciliary directly to angle of mouth.—(B. & G., *descr. orig.*) Rattle and rostral plates as in *C. lucifer*.

Originally described only from Texas, and quoted with this restriction by Professor Cope in 1861 (*l. c.*). This species was ascertained by the Mexican Boundary Survey, results of which were published in 1859, to occur also in the lower portions of Arizona.

43a. *Caudisona adamantea scutulata*, (Kenn.).

Caudisona scutulata, KENN., Proc. Acad. Nat. Sci. Phila., 1861, 207.—COPE, Proc. Acad. Nat. Sci. Phila., 1866, 307, 309.

Crotalus adamanteus, subsp. *scutulatus*, COPE, Check-List, 1875, 33.

Rattle and rostral plates as in *C. lucifer*. Dorsal rows, 25; superior labials, 16; 3-4 rows of interorbital scales, bounded in front by two shields. Yellow stripe from eyebrow above rictus oris. Yellowish-brown, with a dorsal series of truncate, brown, yellow-edged rhombs; tail black-ringed.—(*Kenn.*)

Specimen in my collection from the San Francisco Mountains, July, 1864. Twenty inches long.

44. *Caudisona tigris* (*Kenn.*) *Cope*.

Crotalus tigris, KENN., MSS.—BD., U. S. & Mex. Bound. Surv., ii, pt. ii, 1859, Reptiles, 14, pl. 4 (Gila and Colorado, *A. Schott*).—COPE, Check-List, 1875, 33.

Caudisona tigris, COPE, Mitchell's Res., 1861, 122.—*Id.*, Proc. Acad. Nat. Sci. Phila., 1866, 309.

Body slender; head small, very much depressed, narrow behind; nose remarkably broad and obtuse; whole outline of head nearly quadrangular. Superciliaries and frontals smooth; space between superciliaries very wide; 4 frontals; 6 post-frontals; two rows of scales between suborbital chain (which is complete) and the labials. Labials 14 above; 14-15 below. Dorsal rows 21-23; very slightly carinated. Dorsal scales broad, rounded behind. Color yellowish-ash above, with rather small, indistinct, dorsal brown blotches anteriorly; two posterior thirds of body banded with brown.—(*Kennicott*.) Rattle acuminate; rostral plate equilateral, broad, depressed.—(*Cope*.)

This species, which was not met with by me, occurs in the deserts of the Gila and Colorado Rivers.

45. *Caudisona pyrrha*, *Cope*.

PLATE XXII.

Caudisona pyrrha, COPE, Proc. Acad. Nat. Sci. Phila., 1866, 308, 310 (type No. 6606, Mus. Smiths. Inst., Arizona, near Fort Whipple, coll. *Coues*).

Crotalus pyrrhus, COPE, Check-List, 1875, 33.

DIAG.—Scales in twenty-five series, broad and rounded; the two inferior rows smooth. Head short and very obtuse; the nostrils opening sub-vertically. Superior labials higher than long; three rows of temporals smooth; scales of vertex small, keeled; those more anterior, striate. Superciliaries broad, oval, striate. Canthus rostralis none. Inferior labials fif-

teen, the first and second margining a plate, which meets its fellow in front of the genae, and is in other species a continuation of the first. Gastrosteges, 178; urosteges, 84; joints of rattle, 9. The general tint of this species is a bright salmon-red; the scales of the inferior rows punctulate with brown.

Nasal plates distinct; muzzle with small plates or numerous scales above [as in *cerastes* and *mitchelli*]. Upper margin of canthus rostralis with small scales like the others. Prenasal separated from rostral by scales; superciliary not prolonged. Rostral broad as long; head very obtuse, rounded. Scales 25 rows; 7 between superciliaries, 3 below orbit; labials, 14; 2 very small preorbitals and 4 loreals. Pale-vermillion varied with yellow on the sides of the belly, with numerous large reddish-bay hexagons, which become transverse bands on posterior two-thirds of length; yellow below. Rattle subacuminate.

This species is one of the most handsomely colored of the genus. Its affinities are with the *C. mitchelli*, Cope; but it exhibits an even higher degree of subdivision of the head shields.—(*Cope, descr. orig.*)

A single specimen of this richly colored species was procured at Cañon Prieto, a locality near Fort Whipple. It is not in the best order, as it was procured under the untoward circumstances of a hasty retreat from hostile Indians. The species is probably rare, as I never met with a second example, while that one procured was regarded as a curiosity by the numerous persons who came to see a "red rattlesnake".

46. *Caudisona* (*Æchmophrys*) *cerastes*, (*Hallow.*).

Crotalus cerastes, HALLOW., Proc. Acad. Nat. Sci. Phila., 1854, 95.—*Id.*, P. R. R. Rep., x, 1859, Williamson's Route, Reptiles, 17.—HEERM., *ibid.*, 24.—BD., U. S. & Mex. Bound. Surv., ii, pt. ii, 1859, Reptiles, 14, pl. 3.—COPE, Check-List, 1875, 33.

Caudisona cerastes, COPE, Proc. Acad. Nat. Sci. Phila., 1866, p. —.

Æchmophrys cerastes, COUES.

Head small, with rounded angles; nose depressed, obtuse; rostral as broad as high; nostril in middle of a single large plate; lateral edge of superciliary plate elongated into a horn-like process over the eye. Two rows of scales between the suborbital series and the labials; superior labials

11-13, inferior 12-13. Dorsal rows, 21; the scales slightly carinated; each scale along the middle of back with a tubercular swelling toward the center. Crown tubercular. Entire head and upper parts of a light yellowish, with a dorsal series of small indistinct blotches, below which are several irregular rows of isolated brown dots; a narrow brown stripe from orbit back over angle of mouth.—(*Kennicott*.)

The singular development of the supraorbital plate into a horn-like process, contact of prenasal with rostral, and turgidity of the dorsal and coronal scales, may be considered sufficient grounds for the establishment of a section of the genus, as above indicated.

This rather small species is found with *C. tigris* in the arid region of the Gila and Colorado, where it is common. In the position of the nostrils, it appears related to *Aploaspis*, Cope, type *C. lepida*, Kenn. (Proc. Phila. Acad., 1861, 206). This last species, described from Western Texas, will probably yet be found to inhabit Arizona.

46. *Crotalus edwardsi* (Bd. & Gir.) Cope.

Crotalophorus edwardsii, BD. & GIR., Cat. N. A. Rept., 1853, 15.—DUM. & BIBR., Erp. Gén., vii, 1853.—BD., P. R. R. Rep., x, 1859, pl. 24, f. 8 (no text).—*Id.*, U. S. & Mex. Bound. Surv., ii, pt. ii, 1859, Reptiles, 15, pl. 5, f. 1.

Crotalus edwardsii, COPE, Mitchell's Res., 1861, 125.

Caudisona edwardsii, COPE, Check-List, 1875, 34.

Twenty-three rows of dorsal scales; two first rows smooth. Vertical plate subpentagonal, tapering to an acute point posteriorly. Color light yellowish-brown, with chestnut blotches, lighter than in *C. tergeminus* or *C. consors*. Lateral blotches proportionally small. Yellowish line from nostril to angle of mouth as in *C. consors*; no vertebral reddish line.—(*Baird*.)

This species, with which I did not myself meet, occurs on the southern border of the Territory. Specimens have been described from Sonora on the Mexican boundary line; Tamaulipas, Mexico; and Brownsville, Texas.

Crotalus miliaris is a species probably to be added to the fauna of Arizona.

PROTEROGLYPHA.

ELAPIDAE.

48. *Elaps euryxanthus*, Kenn.—Harlequin Snake.

Elaps euryxanthus, KENN., Proc. Acad. Nat. Sci. Phila., 1860, 337.—COPE, Proc. Acad. Nat. Sci. Phila., 1866, 307.—*Id.*, Check-List, 1875, 34.

Head very small, narrower than the neck; entirely black as far back as the angles of the mouth. Body banded alternately with black and light brick red, separated by narrow rings of creamy white; all the bands immaculate; first broad ring behind the occiput red instead of black, as in the other species.... The plates of the head and the peculiar style of coloration in this strongly marked species cannot be mistaken. The three colors, each immaculate, glossy, and clear, form a striking contrast, and the red is probably bright carmine in life, thus affording the most beautiful coloration possessed by any North American snake.—(*Descr. orig.*)

A rather large, slender, and very beautiful species, known in Arizona as the "King" and "Ring" snake. It is apparently not abundant. One of my two specimens was taken at Fort Whipple, the other on Date Creek. Excepting the rattlesnakes, this is the only venomous reptile I observed in the Territory.

ASINEA.

COLUBRIDAE.

49. *Heterodon simus nasicus*, (Bd. & Gir.).

b. NASICUS.

Heterodon nasicus, BD. & GIR., Stans. Rep. Exp. Great Salt Lake, 1852, 352.—*Id.* Marcy's Rep. Red Riv., 1852, 208.—*Id.*, Cat. N. A. Rept., 1853, 61, 157.—HALLOW., Sitgreave's Exp. Zuñi & Col. Riv., 1853, 147.—BD., P. R. R. Rep., x, 1859, Whipple's Route, Reptiles, 41.—HALLOW., Proc. Acad. Nat. Sci. Phila., 1856, 249.—BD., P. R. R. Rep., x, 1859, Beckwith's Route, Reptiles, 19.—*Id.*, U. S. & Mex. Bound. Surv., ii, pt. ii, 1859, 18, pl. 11, f. 1.—HAYD., Trans. Am. Phil. Soc., xii, 1862, 177.—COPE, Proc. Acad. Nat. Sci. Phila., 1866, 307.—ALLEN, Proc. Bost. Soc. Nat. Hist., xvii, 1874, 69 (Yellowstone).

Heterodon simus, subsp. *nasicus*, COPE, Check-List, 1875, 43.

This species belongs to the section of the genus in which the median plate behind the rostral is separated from the frontals by several small plates. Originally described from Utah, its range has since been ascertained to be general in the West, east of the Rocky Mountains, from the British to the Mexican boundary. I have found it along the northern boundary line, latitude 49° , the northernmost point at which any species of the genus is known to occur; and in most portions of Arizona and New Mexico it is one of the commonest serpents.

50. *Tropidonotus** *sipedon couchi*, (Kenn.).

Nerodia couchii, KENN., Proc. Acad. Nat. Sci. Phila., 1869, 335 (Nuevo Leone).

Tropidonotus sipedon subsp. *couchii*, COPE, Check-List, 1875, 42.

Resembles *N. erythrogaster* [*i. e.*, *Trop. sipedon* var. *erythrogaster*], but the head is shorter and very broad, the muzzle broad and obtuse. Post-orbitals three, much larger than in *N. erythrogaster*, the lower extending forward beyond the middle of the eye. Eight upper labials, all large; the seventh much larger than in *N. erythrogaster*. The dorsal scales are broader and less strongly keeled, and in twenty-three rows. Color uniform light dull slaty brown above, paler than in *erythrogaster*.—(Kennicott.)

A species of the Sonoran Region as defined by Professor Cope.

51. *Tropidonotus validus*, (Kenn.) Cope.

PLATE XXI.

Regina valida, KENN., Proc. Acad. Nat. Sci. Phila., 1860, 334.

Tropidonotus validus, COPE, Proc. Acad. Nat. Sci. Phila., 1866, 310.—*Id.*, Check-List, 1875, 42.

Body stout for the genus. Head large, short but high; broad posteriorly. Snout elongated, narrow, and pointed. Vertical very narrow, obtusely pointed posteriorly; occipitals small; nineteen rows of scales, all carinated; the exterior very feebly. Light brownish-ash above, with faint black markings upon the bases of the scales of the first, fourth, and eighth rows; abdomen entirely uniform yellowish.—(Kennicott.)

This species, resembling the better known *T. erythrogaster*, was originally described from Durango, Mexico, and I only know of it as an inhabitant of the Territory from Professor Cope's indication above cited.

**Nerodia* + *Regina*, Bd. & Gir.

52. *Eutænia ornata*, Bd. & Gir.

Eutania parietalis, BD. & GIR., Cat. N. A. Rept., 1853, 38 (*synon. excl. Non Coluber parietalis Say*).

Eutania ornata, BD. & GIR., U. S. & Mex. Bound. Surv., ii, pt. ii, 1859, Reptiles, 16, pl. 9.—COPE, Proc. Acad. Nat. Sci. Phila., 1866, 305, 306.—COPE, Check-List, 1875, 41.

In this apparently well marked species, there are nineteen rows of dorsal scales, on the second and third of which are the lateral stripes. The body is rather slender, and the tail more than a fourth of the total length. The color above is olive-brown; the bands are greenish-yellow, and on the stretched skin red spots show among the black ones, which occur along the sides.

In their aquatic habits, these snakes differ from *E. cyrtopsis* and *macrostemma*, neither of which, according to my observations, are specially addicted to the water, frequenting dry herbage and bushes like *E. sirtalis* of the East. I found *E. ornata*, in June, 1864, in considerable numbers, basking about small, shallow pools in the *bosqué* of cottonwood which fringes the Rio Grande at Los Pinos, N. Mex. No specimens are contained in my collections from Arizona itself, where the aquatic species, observed at various points, is *E. vagrans*.

53. *Eutænia cyrtopsis*, Kenn.

PLATE XX, FIGS. 2, 2a.

Eutania cyrtopsis, KENN., Proc. Acad. Nat. Sci. Phila., 1860, 333.—COPE, Proc. Acad. Nat. Sci. Phila., 1866, 306.—COPE, Check-List, 1875, 41.

Form very slender; but little stouter than that of *E. saurita*; but with shorter tail, one-fourth the total length. Head and eye large. Superior labials eight, the sixth and seventh largest. Postorbitals three; upper much the largest. Dorsal scales in nineteen rows; lateral stripe on the second and third rows. Olive-brown, with two alternating series of elongated spots between the stripes, giving the appearance of a zigzag line. Dorsal stripe narrow, distinct to the end of the tail, whitish; lateral stripe like the dorsal in color, broad, distinct from head to arms. A series of black spots on the first dorsal row. Abdomen uniform greenish-white. Orbits whitish. Occipital spots obsolete.—(*Kennicott*.)

This species, originally described from Coahuila, Durango, and the Gila River, was found to be quite common at Fort Whipple, where numerous specimens were observed besides the few transmitted to Washington. It grows to a large size, equaling or surpassing *E. sirtalis* in this respect, but preserving its very slender form, which, with the strong, clear stripes, renders it an attractive object. The larger animals, which I kept in confinement, were quite savage when first caught, biting when taken in hand, and even acting sometimes on the offensive when irritated; but they usually became gentle and submissive after a little handling.

53. *Eutænia vagrans*, Bd. & Gir.

Eutænia vagrans, BD. & GIR., Cat. N. A. Rept., 1853, 35.—GIR., U. S. Exp. Exped. Herp., 1858, 154, pl. 14, figs. 5–10.—BD., P. R. R. Rep., x, 1859, Beckwith's Route, Reptiles, 19, pl. 17.—COOP. & SUCKL., Nat. Hist. Wash. Terr., 1860, 297.—COPE, Proc. Acad. Nat. Sci. Phila., 305, 307.—COPE, Check-List, 1875, 41.

? *Eutænia angustirostris*, KENN., Proc. Acad. Nat. Sci. Phila., 1860, 332.

As in *E. macrostemma*, the dorsal scales are in twenty-one rows; but the lateral stripe is on the second and third, not third and fourth. There are eight superior labials, of which the sixth and seventh are very large, being higher than wide, one of them extending above the lower level of the eye. The color is a light olive-brown, or ashy-brown; the head indifferently brown or black on top. The bands are narrow, unmarginated; the dorsal one strong; the lateral ones less distinct; and there are two series of small, black, lateral spots, which encroach at regular intervals upon both the longitudinal bands.

This species appears to merit its name, since, unlike several others of local distribution, it is widely dispersed in the West. My latest investigations carry its range to the northern borders of Dakota and Montana, and even a little beyond the watershed of the Missouri, into that of the Saskatchewan, as I found it in the summer of 1874 at Chief Mountain Lake, latitude 49° N., where it was associated with the form of *E. sirtalis* called *E. pickeringi*. I also found it in a corresponding latitude farther east, along with *E. radix*. It is a common species in various parts of Arizona and New Mexico. My specimens were found along the Zuñi River in New Mexico, wherever this

stream spread into sluggish lagoons, basking on the floating plants, or swimming freely in the water like a *Nerodia* or *Regina*. Others were taken on the San Francisco Mountains in Arizona. They were all rather small, under two feet in length, and differed much in the coloration of the head, which, in some cases, was pitchy black, contrasting strongly with the brown of the body; in others brown. This difference, however, appears to be fortuitous, as both kinds were found together, evidently representing but one species.

755. *Eutænia macrostemma*, Kenn. (teste Cope).

Eutænia macrostemma, KENN., Proc. Acad. Nat. Sci. Phila., 1860, 331.—(?)COPE, Proc. Acad. Nat. Sci. Phila., 1866, 306, 307 (rather var. *megalops*).

Dorsal scales in twenty-one rows, the lateral on the third and fourth. Frontal plate longer than the occipital suture. Temporal small, margining only the anterior part of penultimate labial. Post-geneials longer than pre-geneials; superior labials eight; loreal higher than long. Olivaceous, with one row of small black spots below, and two rows above the lateral stripe. Two small black nuchal spots and a short post-oral pale crescent.—(Cope.)

In the original description, Mr. Kennicott gives the ground color as very dull yellowish-brown; the dorsal stripe broad, covering nearly three rows of scales, light brownish, but little lighter than the ground color, indistinctly bordered with black; the lateral stripe indistinct, dull yellowish-green, and two broken series of indistinct spots along the sixth and seventh rows of scales; the abdomen immaculate, a varying shade of green; the head dark-brown above; the superior labials but little lighter, narrowly black-bordered behind. The type is from the city of Mexico.

Two specimens from Fort Whipple, identified with this species by Professor Cope. They appear, however, to rather represent the following variety, as the true *macrostemma* probably does not occur so far north.

55a. *Eutænia macrostemma megalops*, (Kenn.)

Eutænia megalops, KENN., Proc. Acad. Nat. Sci. Phila., 1860, 330.

Eutænia macrostemma subsp. *megalops*, COPE, Check-List, 1875, 41.

“Form shorter and stouter, with proportionally shorter tail than in *E. proxima*, which this species resembles. Tail one-fourth of the total length. Eye very large, greater than in *E. proxima*. First dorsal row of scales broader;

each scale as high as long, and less strongly carinate. Dorsal stripe narrow, covering one and less than two half rows of scales. . . . Color uniform dull brownish-ash or clay color, with the dorsal and lateral stripes whitish-yellow. A few of the scales have narrow black spots on their edges, but these are prominent, and never extend over a scale, appearing as indistinct mottlings of black on the ground color always on the rows next the stripes. The head above is light olive-ash. The lateral stripe is on the third and fourth rows, and is narrower than in *E. proxima*, covering rather less than two half scales. The color below the lateral stripe is a little lighter than that of the back. The exterior dorsal row is much wider than in any of the allied species, each scale being as high as long. The second row is much narrower, though a little wider than the third. The eye is strikingly large, and the superciliaries are raised, rendering the fore part of the crown an inclined plane, yet the muzzle is higher than in *E. proxima*."—(*Descr. orig.*)

With this species, described from Tucson, I am acquainted only by the above description, as no specimens were included in my collections.

56. *Bascanium** *tæniatum*, (Hallow.) Cope.

Leptophis tæniata, HALLOW., Proc. Acad. Nat. Sci. Phila., vi, 1852, 181.—*Id.*, Sitgreave's Exp. Zuñi & Col. Riv., 1853, 133, 146.

Masticophis tæniatus, BD. & GIR., Cat. N. A. Rept., 1853, 103.—BD., P. R. R. Rep., x, 1859, Beckwith's Route, Reptiles, 20, pl. 23.—*Id.*, *ib.*, Abbott's Route, Reptiles, 11.—COOP. & SUCKL., Nat. Hist. Wash. Terr., 1860, 302.—COPE, Proc. Acad. Nat. Sci. Phila., 1866, 305.

Drymobius tæniatus, COPE, Proc. Acad. Nat. Sci. Phila., 1860, 561.

Bascanium tæniatum, COPE, Check-List, 1875, 40.

Masticophis schottii, BD. & GIR., Cat. N. A. Rept., 1853, 160.—BD., U. S. & Mex. Bound. Surv., ii, pt. ii, 1859, Reptiles, 20, pl. 18.

? *Leptophis lateralis*, HALLOW., Proc. Acad. Nat. Sci. Phila., 1853, 237 (a separate variety?).

Several specimens from various parts of the Territory, including old and young; the former considered by Professor Cope to represent "*Leptophis lateralis*" of Hallowell. The *B. tæniatum*, as redescribed by Baird and Girard, has a broad, brown, dark-edged, dorsal band, six and two half scales wide, and yellow lateral bands, four scales wide, with a dark line on each scale, and another dark line along the edge of the abdomen (six dark lines

* *Bascanion* + *Masticophis*, Bd. & Gir.

in all); the belly yellowish. The characters of a supposed second species, *M. schottii*, have been found by Cope not to hold good.

Var. *ornatum* (*Masticophis ornata*, B. & G., Cat., 102), from Western Texas, is probably to be added to the list.

57. *Bascanium flagelliforme testaceum*, (Say) Cope.

Coluber testaceus, SAY, Long's Exped. Rocky Mts., ii, 1823, 48.—HARLAN, Jour. Acad. Nat. Sci. Phila., v, 1827, 348.—HOLB., N. A. Herp., iii, 1842, 63, pl. 13.—HARLAN, Med. & Phys. Res., 1835, 113.—BD. & GIR., Cat. N. A. Rept., 1853, 150.

Masticophis testaceus, BD. & GIR., U. S. Mex. Bound. Surv., ii, pt. ii, 1859, 20, pl. 16.—BD., P. R. R. Rep., x, 1859, Whipple's Route, Reptiles, 43.—COPE, Proc. Acad. Nat. Sci. Phila., 1866, 305.

Drymobius testaceus, COPE, Proc. Acad. Nat. Sci. Phila., 1860, 561.

Psammophis flavigularis, HALLOW., Proc. Acad. Nat. Sci. Phila., vi, 1852, 178.—*Id.*, Sitgreave's Exp. Zuñi & Col. Riv., 1853, 131, 146, pl. 11.

Masticophis flavigularis, BD. & GIR., Cat. N. A. Rept., 1853, 99, 159.

Herpetodryas flavigularis, HALLOW., P. R. R. Rep., x, 1859, Williamson's Route, Reptiles, 12.

Bascanium flagelliforme subsp. *testaceum*, COPE, Check-List, 1875, 40.

The recognition, in the present species, of the *Coluber testaceus* of Say, satisfactorily completes the identification of the species of that eminent and successful naturalist.

The present is a species of general distribution in Arizona, being met with both in the mountainous and desert portions of the Territory, and is one of the common Ophidians.

57a. *Bascanium flagelliforme piceum*, Cope.

Bascanium flagelliforme subsp. *piceum*, COPE, Dr. Yarrow's Rep., *antea*.—*Id.*, Check-List, 1875, 40.

Camp Grant, Ariz.

58. *Pityophis sayi bellona*, (Bd. & Gir).

a. SAYI.

Coluber melanoleucus var., SAY.—HARLAN, Jour. Acad. Nat. Sci. Phila., v, 1827, 360.—*Id.*, Med. & Phys. Res., 1835, 123.

Coluber sayi, SCHL., Ess. Physiog. Serp., 1837, 157 (not *Coronella sayi*, HOLBR., nor *Coluber sayi*, HARLAN, which are *Ophibolus*).—BD. & GIR., Cat. N. A. Rept., 1853, 151.

Pityophis sayi, BD. & GIR., Cat. N. A. Rept., 1853, 152 (in text).—KENN. *apud* COOP. & SUCKL., Nat. Hist. Wash. Terr., 1860, 300, pl. 22.—HAYD., Trans. Am. Phil. Soc., xii, 1862, 177.

b. BELLONA.

Churchillia bellona, BD. & GIR., Stans. Rep. Exp. Great Salt Lake, 1852, 350.

Pituophis bellona, BD. & GIR., Cat. N. A. Rept., 1853, 66, 157.

Pityophis bellona, KENN. *apud* BD., P. R. R. Rep., x, 1859, Williamson's Route, Reptiles, 42.—BD., P. R. R. Rep., x, 1859, Beckwith's Route, Reptiles, 19.—KENN. *apud* BD., U. S. & Mex. Bound. Surv., ii, pt. ii, 1859, Reptiles, 18.—COPE, Proc. Acad. Nat. Sci. Phila., 1866, 305.—ALLEN, Proc. Bost. Soc. Nat. Hist., xvii, 1874, 69.

Pityophis affinis, HALLOW., Proc. Acad. Nat. Sci. Phila., vi, 1852, 181.—*Id.*, Sitgreave's Exp. Zuñi & Col. Riv., 1853, 130, 146, pl. 10.

Pityophis sayi var. *bellona*, COPE, Check-List, 1875, 39.

Although perfectly harmless, this species is commonly called "Adder", like *Heterodon nasicus* and other blotched serpents, more or less resembling some of the venomous ones; it is also known as Bull Snake. *P. bellona* is one of the most abundant of all the species about Fort Whipple, where specimens could be found at any time during the summer in the grass and woods. Numbers used to be killed in the fort and surrounding buildings.

The great variability of this species, not only in color, but also in the details of the plates of the head, points not at first recognized, necessitates the reference of *bellona* to the longer known *Coluber sayi*. The use of the name "*sayi*" in this connection is to be carefully discriminated from its employ for an altogether different species of *Ophibolus*.

In addition to the foregoing, Professor Cope indicates a subspecies *mexicana* (D. & B.), as occurring in the Central and Sonoran Regions. Of this form I know nothing.

59. *Pityophis elegans* (Kenn.) Cope.

Arizona elegans, KENN., *apud* BD., U. S. & Mex. Bound. Surv., ii, pt. ii, Reptiles, 18.

Pityophis elegans, COPE, Check-List, 1875, 39.

"Sonoran Region."

60. *Ophibolus getulus boylii*, Bd. & Gir.

Ophibolus boylii, BD. & GIR., Cat. N. A. Rept., 1853, 82.—BD., P. R. R. Rep., x, 1859, Williamson & Abbott's Route, Reptiles, 11.—*Id.*, U. S. & Mex. Bound. Surv., ii, pt. ii, 1859, Reptiles, 20.—COPE, Proc. Acad. Nat. Sci. Phila., 1866, 305.

Lampropeltis boylii, COPE, Proc. Acad. Nat. Sci. Phila., 1860, 255.

Coronella balteata, HALLOW., Proc. Acad. Nat. Sci. Phila., 1853, 236.—*Id.*, P. R. R. Rep., x, 1859, Williamson's Route, Reptiles, 14.

Ophibolus getulus subsp. *boylii*, COPE, Check-List, 1875, 37.

Specimens from Date Creek, fifty miles south of Fort Whipple. This species, originally described from California, has an extensive dispersion in the West as far north as the Yellowstone, as I find a specimen in a collection from that region.

60a. *Ophibolus getulus splendidus*, Bd. & Gir.

Ophibolus splendidus, BD. & GIR., Cat. N. A. Rept., 1853, 83 (Sonora).—BD., U. S. & Mex. Bound. Surv., ii, pt. ii, 1859, Reptiles, 20, pl. 14 (Arizona).—COPE, Proc. Acad. Nat. Sci. Phila., 1866, 310.

Lampropeltis splendida, COPE, Proc. Acad. Nat. Sci. Phila., 1860, 255 (Fort Buchanan, Ariz).

Ophibolus getulus subsp. *splendidus*, COPE, Check-List, 1875, 37.

Not contained in my collections. It appears to be rather an inhabitant of the southern portions of the Territory and southward.

61. *Ophibolus pyromelas*, Cope.

PLATE XIX, FIGS. 1, 1a, 2.

Ophibolus pyromelanus, COPE, Proc. Acad. Nat. Sci. Phila., 1866, 305 (described from Nos. 731 and 760 of my collection from Fort Whipple, August, 1864).

Ophibolus pyromelas, COPE, Check-List, 1875, 37.

"Scales in 23 longitudinal rows; tail five and one-half times in total length. Scuta 224, 1, 66. Fifty to fifty-eight black annuli on an ochraceous white ground, on the body; each anteriorly completely, posteriorly more or less incompletely, split by a vermilion annulus; all extending with irregularities on the belly.

"Head quite distinct from body; muzzle contracted. Frontal plate broad, with prolonged apex; parietals elongate, emarginate behind; cephalic shields otherwise as in *polyzonus*, *splendidus*, &c. Postgeneials half the length of the pregeneials. Dorsal scales rather broad; outer series not abruptly enlarged. In one specimen, all the black annuli to the middle of the tail are divided by the red, thus leaving the black as a margin to it; hence the number of these annuli is fewer; they are four scales wide behind the middle of the body. In another specimen, only four anterior rings are com-

pletely divided, those on the following third of the length being divided by red on the sides; the remaining annuli black, three scales wide; white annuli one and one-half scales; anterior or nuchal red; annulus widest, its anterior black margin attaining parietals; an ochraceous band from gular region, not quite completed across parietals. Muzzle, prefrontal plates, and labial margin ochraceous; remainder of top and sides of head black. Total length, 30.5 inches.

"This species has a longer body than the known red-ringed species, and is, indeed, most closely related to the *O. boylii*. It will always be distinguished for the latter by the much more numerous annuli (twenty-eight in *boylii*)."—Cope.

62. *Phimothyra grahamiæ*, (Bd. & Gir.) Cope.

Salvadora grahamiæ, BD. & GIR., Cat. N. A. Rept., 1853, 104, 161 (type of genus). (Sonora, Mex.).—BD., U. S. & Mex. Bound. Surv., ii, pt. ii, 1859, 21, pl. 5, f. 2.

Phimothyra grahamiæ, COPE, Proc. Acad. Nat. Sci. Phila., 1866, 310.—*Id.*, Check-List, 1875, 38.

Lower California, Sonora, and Arizona, to Utah and Texas.

62a. *Phimothyra grahamiæ hexalepis*, Cope.

Phimothyra hexalepis, COPE, Proc. Acad. Nat. Sci. Phila., 1866, 305 (described from my specimen from Fort Whipple).

Phimothyra grahamiæ subsp. *hexalepis*, COPE, Check-List, 1875, 38.

"Resembles the *P. grahamiæ* (*Salvadora grahamiæ*, B. & G.), but differs in having a shorter tail, five and one-third times in length, instead of four times; eye resting on sixth supralabial, on account of the presence of three narrow preoculars, two or three loreals—largest higher than long; nostril on suture between nasals and internasals; dorsal stripe narrow—one and two half scales, and lateral brown band wide, four and a half to five scales, whose *superior* margins are ochraceous at base. Rostral plate well developed, higher than broad; nasals elongate, much depressed, anterior extending behind first labial; postoculars two; two long narrow temporals. Width of occipitals nearly equal common suture. Nine superior labials; first pair inferior labials much dilated medially, their common suture nearly equal that of pregenaeals; scales seventeen rows. Gastrosteges, 176; urosteges, 75. Tail and below uniform yellowish."—Cope.

Fort Whipple. The stomach contained a *Cnemidophorus sexlineatus*.

63. *Trimorphodon lyrophanes*, Cope.*Lycodon lyrophanes*, COPE, Proc. Acad. Nat. Sci. Phila., 1860, 343.*Trimorphodon lyrophanes*, COPE, Proc. Acad. Nat. Sci. Phila., 1866, 310.—*Id.*, Check-List, 1875, 38.

Scales in 21 rows, broad posteriorly and upon the middle of the body, the dorsal series not larger; body anteriorly slender; neck contracted. Tail not one-sixth the total length. Head broadest just behind the eyes; constricted at the orbits. Muzzle rather narrow and truncate. Rostral broader than high, with four sutural borders; the superior one very long; the apex apparent upon the surface of the head. Prefrontals much broader than long; one-third the size of that part of the postfrontals visible from above. Postfrontals longer than broad upon vertical view. Occipitals, superciliaries, and vertical well developed; the last right-angled posteriorly, with slightly concave and convergent lateral borders. Occipitals not longer than vertical; about as wide as long; in contact with a large scale in their posterior common emargination. Nasal plates distinctly divided, very small, higher than long. Loreals *two*; anterior one higher than long, wedged above between pre- and postfrontal; the posterior as long as high. Preoculars *three*; the superior largest, not in contact with the vertical; the inferior bounded anteriorly by the third upper labial. Postoculars three; the inferior a little the largest. Superior labials nine; fourth and fifth entering the orbit, sixth largest, higher than broad. Inferior labials twelve, third and fourth narrow, and much produced posteriorly. Geneials two pair, the anterior longest. Gastrosteges, 236; one divided anal; urosteges, 70. Length, 27 inches 10 lines; tail, 4 inches 4 lines. Ground color light-gray. Muzzle crossed by an indistinct ashy band, which extends upon the anterior part of the postfrontals. The posterior half of these plates is involved in a deep-brown band across the head between the eyes, with concave posterior border, extending upon the superciliaries, and continued posteriorly upon the inferior postorbital and sixth upper labial. A pair of broad diverging bands, commencing one on either side of the center of the vertical, crosses the superciliary and occipital, follows the expanded outline of the temporal and tympanic regions, contracts and becomes parallel and longitudinal upon the neck. A brown spot upon the posterior extremity of the verticals, with its posterior

elongation, completes the resemblance to a lyre, or rather a Jew's-harp. The ground color appears upon the vertex as an anchor-shaped figure, and on the cheeks as an oblique band. The back, as far as the anus, has 21 pairs of deep-brown spots, their gemination only apparent anteriorly by the punctulate character of the scales in their intervals. These are always about 3 scales wide; the lesser ones $2\frac{1}{2}$ anteriorly, $1\frac{1}{2}$ posteriorly. Dorsal spots 7 scales wide; as the scales are broader posteriorly, the spots are also. An irregular series of lateral spots, one opposite each of the intervals, sometimes confluent with the dorsal spots, anteriorly forming a very narrow broken band. Another series of spots involves the tips of pairs of the gastrosteges, which are separated by 2 to 5 immaculate ones. Ten confluent pairs of spots on the tail above. Whole under surface whitish.—*From the orig. descr.*

This tropical form is one of the most interesting of the later additions to our fauna. It was first discovered in the United States by Dr. B. J. D. Irwin, U. S. A., at Fort Buchanan, Ariz.; but had been previously taken at Cape Saint Lucas. In describing it, Professor Cope at first referred it to the genus *Lycodon*, Duméril, but subsequently placed it in *Trimorphodon*.

The *Sibon annulatum* var. *septentrionalis* (*Dipsas septentrionalis*, Kenn., U. S. & Mex. Bound. Surv., ii, pt. ii, 1859, Reptiles, 16), from Southwestern Texas, will probably be found in the Territory. For the position of this form, see Cope, Proc. Phila. Acad., 1860, 266.

64. *Hypsiglena ochrorhyncha chlorophæa*, Cope.

a. OCHRORHYNCHA.

Hypsiglena ochrorhynchus, COPE, Proc. Acad. Nat. Sci. Phila., 1860, 246 (type of the genus), (Cape Saint Lucas).—*Id.*, Check-List, 1875, 38.

b. CHLOROPHÆA.

Hypsiglena chlorophæa, COPE, Proc. Acad. Nat. Sci. Phila., 1860, 247 (Fort Buchanan, Ariz.).

Hypsiglena ochrorhynchus var. *chlorophæa*, COPE, *op. cit.*, 1866, 304.

Hypsiglena ochrorhynchus subsp. *chlorophæa*, COPE, Check-List, 1875, 38.

My specimens from Arizona, the precise locality not indicated, are of the variety *chlorophæa*, originally described as a distinct species. The numerous small dorsal spots are mostly divided. The original form is from Lower California. The Arizonan variety is described substantially as follows:—

Rather more slender than *H. ochrorhynchus*; scales more elongate, and rows more oblique; vertical plate rather broader, and head relatively narrower. Color greenish-ash, darker than in *H. ochrorhynchus*; the dorsal spots black instead of brown, smaller 2 scales apart, $1\frac{1}{2}$ scale long, 58 to 66 in number on the body, occupying only the space from the ninth to the thirteenth dorsal row, frequently dividing and alternating; two rows of smaller alternating spots on the sides, one on sixth and seventh rows, the other on the fourth row; crown and muzzle thickly dotted with black; beneath pale olivaceous; distribution of colors on the head and neck much as in *H. ochrorhynchus*, but the neck spots rather larger, the brown replaced by black, the ochraceous by olivaceous. Gastrosteges, 167; urosteges, 55. Length, $15\frac{1}{2}$ inches; tail, $2\frac{1}{4}$.

65. *Diadophis regalis*, Bd. & Gir.

Diadophis regalis, BD. & GIR., Cat. N. A. Rept., 1853, 115, 161 (Sonora).—BD., U. S. & Mex. Bound. Surv., ii, pt. ii, 1859, 22.—COPE, Proc. Acad. Nat. Sci. Phila., 1866, 310.—COPE, Check-List, 1875, 38.

From the Sonoran border; not met with by me. According to its describers, this species lacks an occipital ring; dorsal scales 17 rows; body above uniform greenish-ash; below light-yellow, with numerous small black spots.

? *Diadophis docilis*, Bd. & Gir.

Diadophis docilis, BD. & GIR., Cat. N. A. Rept., 1853, 114 (Devil's River, Texas).—BD., U. S. & Mex. Bound. Surv., ii, pt. ii, 1859, 22, pl. 21, f. 3 (Tucson, &c.).

Not seen by me. It is described as uniform ashy-gray above, yellowish-white spotted with black below, with a broad yellowish-white occipital ring, bordered with a narrow black line; the dorsal scales in 15 rows.

66. *Rhinochilus lecontii*, Bd. & Gir.

Rhinocheilus lecontei, BD. & GIR., Cat. N. A. Rept., 1853, 120, 161 (type of the genus), (San Diego, Cal.).

Rhinochilus lecontii, BD., U. S. & Mex. Bound. Surv., ii, pt. ii, 1859, Reptiles, 21, pl. 20 (San Pedro, Tex.).

Rhinochilus lecontei, COPE, Proc. Acad. Nat. Sci. Phila., 1866, 304 (variety).—COPE, Check-List, 1875, 36.

My specimens from Arizona, without indication of particular locality, represent, according to Professor Cope, a variety, having fewer (twenty) black half-rings on the body, extending to the gastrosteges and separated

by a narrow interval. Abdomen with subquadrate black spots opposite the former and their intervals.

67. *Gyalopium canum*, Cope.

PLATE XVIII, FIG. 2, 2a.

Gyalopium canum, COPE, Proc. Acad. Nat. Sci. Phila., 1860, 243.

Gyalopium canum, COPE, Proc. Acad. Nat. Sci. Phila., 1860, 310.—*Id.*, Check-List, 1875, 36.

Prefrontals triangular, not larger than preoculars. Postoculars of equal size. Anterior border of vertical not angulated. Occipitals as broad as long, truncate posteriorly. Superior labials 7, eye over third and fourth. Inferior labials 7, fourth largest. Genials one pair, very short. Scales in 17 rows, nearly square. Gastrosteges, 130; one anal; urosteges, 28. Total length, $7\frac{1}{2}$ inches; tail, 11 lines. Above brownish-gray, crossed by 31 irregular transverse brown bands; these are from one to three scales wide on the back, and extend to the gastrosteges; anteriorly they exhibit a tendency to divide into a dorsal and two lateral series of spots; 8 transverse spots on the tail; first spot on the neck large, produced medially to the occipitals. A brown band extends from one angle of the mouth to the other across the occipitals, involving the tip of the vertical; another brown band commences on the upper borders of the lower labial shields, passes through the eye, and crosses the anterior parts of the superciliaries, and vertical and posterior parts of postfrontals and rostral. Dirty yellowish beneath, and upon the first row of scales.—*Descr. orig.*

"It is an extraordinary serpent, resembling, at first sight, a diminutive *Heterodon*", and was discovered at Fort Buchanan, Ariz., by Dr. B. J. D. Irwin, U. S. A.

68. *Sonora semiannulata*, Bd. & Gir.

Sonora semiannulata, BD. & GIR., Cat. N. A. Rept., 1853, 117 (type of genus.)—BD., U. S. & Mex. Bound. Surv., ii, pt. ii, 1859, Reptiles, 21, pl. 19, f. 3.—COPE, Proc. Acad. Nat. Sci. Phila., 1866, 310.—*Id.*, Check-List, 1875, 36.

Sonora and Southern Arizona. Not seen by me.

69. *Chionactis occipitalis*, (Hallow.) Cope.

a. OCCIPITALIS.

Rhinostoma occipitale, HALLOW., Proc. Acad. Nat. Sci. Phila., vii, 1854, 95.

Lamprosoma occipitale, HALLOW., Proc. Acad. Nat. Sci. Phila., viii, 1856, 310.—KENN.

apud BD., U. S. & Mex. Bound. Surv., ii, pt. ii, 1859, Reptiles, 21, pl. 21, f. 1.

Chionactis occipitale, COPE, Proc. Acad. Nat. Sci. Phila., 1866, 310.

b. ANNULATUS.

Lamprosoma annulatum, KENN. *apud* BD., U. S. & Mex. Bound. Surv., ii, 1859, 22,
(in text: Colorado Desert, Ariz.; name proposed if distinct from true *occip-
itale*, HALLOW.).

Chionactis occipitalis subsp. *annulata*, COPE, Check-List, 1875, 36.

Southern and Southwestern Arizona. Not seen by me.

70. *Contia isozona*, Cope.

PLATE XVIII, FIGS. 1, 1a.

Contia isozona, COPE, Proc. Acad. Nat. Sci. Phila., 1866, 304.—*Id.*, Check-List, 1875, 36.

Two postoculars; six rows of gular scales. Rostral rounded, slightly produced backward. Scuta $158\frac{1}{1}$, 52. Twenty black half rings, separated by equal spaces of pinkish ground color. Eye small; its diameter contained twice in length of muzzle.

Preorbital narrower above, not extending above lower margin of superciliary; loreal twice as long as high. Prefrontals and internasals much broader than long; frontal slightly angulate in front, longer than broad; parietals rather elongate, subtruncate behind. Postorbitals subquadrate; temporals 1-2. Postgenaeals minute. Superior labials seven, all higher than long; eye over third and fourth. Scales in fifteen rows, all broader than long. Tail four and two-fifths times in total length, which is 10.25 inches. Below immaculate. Tail completely six-annulate.

Resembles the *Sonora semiannullata*, B. & G., but that species has two nasals, three postoculars, the superior reaching the frontal; frontal wider behind than before, and only 149 gastroteges.—*Cope*.

Described from specimens in my collection. The same author indicates a variety of the species from Utah, with longer body, twenty-five black bars; body color vermilion above and yellow below; scuta $167\frac{1}{1}$, 52.

71. *Chilomeniscus ephippicus*, Cope.

PLATE XVIII, FIGS. 3, 3a.

Chilomeniscus ephippicus, COPE, Proc. Acad. Nat. Sci. Phila., 1867, 85.—*Id.*, Check-List, 1875, 35.

Scales broad, in 13 rows. Tail about one-seventh total length. Rostral plate large, entirely separating internasals, not encroaching on prefrontals;

nasal plate separating prefrontals and labials, in contact with preocular. Postoculars 2, upper only in contact with occipital. Superciliaries very narrow; occipitals as broad as long. Temporals $\frac{1}{1}$, large; labials above 7, third and fourth in orbit; these, with second, narrow, erect; first longitudinal. Inferior labials 8; first pair in contact before pregenecials; postgenecials very small. Total length, $5\frac{1}{2}$ inches. Gastrosteges, 113; separated from genecials by 4 rows of gulars; anal, 1-1; urosteges, 28-28. Above reddish or yellowish, with 21 black cross-bars to vent, which are broader than the interspaces, and do not quite reach gastrosteges. Five nearly complete rings on tail. Belly white. From occipitals to anterior part of frontal, with the labials opposite this part (except their lower edges), black.—*Cope*.

Originally described from Owen's Valley, California (*Dr. Horn*), and subsequently indicated as occurring in the Sonoran Region.

In the plate, Fig. 3a represents the position of the head shields as seen from above.

72. *Tantilla nigriceps*, *Kenn.*

Tantilla nigriceps, KENN., Proc. Acad. Nat. Sci. Phila., 1860, 328.—COPE, Check-List, 1875, 35.

Form more slender and head narrow than in *T. gracilis*. Vertical plate more elongate posteriorly; occipitals narrower. One anteorbital; two post-orbitals. Seven upper labials. Color (in alcohol) uniform brownish-white above, lighter beneath. Crown as far back as the occipitals deep black. No indication of a postoccipital black ring, as in *T. coronata*.

Originally described from Texas and New Mexico, and since ascertained to inhabit Arizona.

SCOLECOPHIDIA.

STENOSTOMATIDAE.

73. *Stenostoma dulce*, (*Bd. & Gir.*).

Rena dulcis, BD. & GIR., Cat. N. A. Rept., 1853, 142.

Stenostoma dulce, COPE, Check-List, 1875, 44.

Indicated by Professor Cope from the Sonoran Region and Texas.

B.—BATRACHIA.
ANURA.
BUFONIFORMIA.
BUFONIDAE.

74. *Bufo microscaphus*, Cope.

Bufo microscaphus, COPE, Proc. Acad. Nat. Sci. Phila., 1866, 301.—*Id.*, Check-List, 1875, 29.

Head broader than long, obtuse; muzzle descending in full arc to labial border from line of orbit. Superciliary ridges well marked, but concealed by the thick skin, plane, parallel. Postorbital not prominent. Vertical gutter narrow. Eyes large, prominent; double tympanum. Parotoids broad, smooth. Skin little roughened. Toes two-thirds webbed. Shovel very small, frequently not black-edged; outer tubercle small, heel to end of muzzle. Above blackish, a black spot on each parotoid, and dark light-centered bar on femur and tibia. A yellowish bar across front and palpebræ, and spot on nape; muzzle dark. Total length, 1 inch 5.5 lines; to postorbital ridge, 7.5 lines; fore limb, 1 inch 9 lines; hind limb, 3 inches 2 lines, femur one-third included. . . . The oval well-separated parotoids and general appearance of this species ally it to the *B. speciosus*, Girard. But in that animal the supraorbital ridges are obsolete, and the metatarsal shovel is very much stronger. The *B. dorsalis*, Hallowell (*B. woodhousei*, Gird.), is also allied, but is in all proportions and details more elongate, and has a stronger shovel and head-ridges; it always has the dorsal band, which never exists in the *microscaphus*, and never the transverse face-band of the latter.—*Descr. orig.*

Numerous specimens are in my collection from Fort Whipple, where it is the characteristic species, and very abundant.

75. *Bufo lentiginosus frontosus*, Cope.

Bufo frontosus, COPE, Proc. Acad. Nat. Sci. Phila., 1866, 301.

Bufo lentiginosus subsp. *frontosus*, COPE, Check-List, 1875, 29.

A species most allied to the *B. americanus*, but differing in the shorter

and more elevated cranium, longer and larger hind limbs, and more acuminate parotoid glands. The canthus rostrales not marked; the muzzle descending very steeply from the anterior angles of the orbits, shorter than the elevated, perpendicular muzzle. Frontal ridges higher than eyelids, rising steeply behind, terminating in two short convergent tuberosities, divergent, with interior crenations behind. Postocular ridge equally developed, sending a very small process to the anterior acuminate extremity of the parotoids. Elevation of cranium at parietal tubercle equal to length of same from the same point. Eye large; tympanum distinct, half eye; parotoid narrow, long, acuminate at both ends. Elbow to anterior margin of orbit; heel to end of muzzle. Skin everywhere with numerous small tubercles; soles rough; toes half webbed. Brown above, with pale vertebral line, and three pairs of deep-brown medium-sized spots, with paler centers. Sides and lips with small brown spots. Femur and tibia with one indistinct brown cross-bar each. Below uniform yellow. Total length, 4 inches, of which the head is 9 lines to postocular ridges; breadth between orbits, 2.5 lines; hind limb, 5 inches; sacrum, 1 inch across.—*Descr. orig.*

One specimen from Los Pinos, Rio Grande, N. Mex.; type of the species.

76. *Bufo alvarius*, Gir.

Bufo alvarius, GIR., *apud* BD., U. S. & Mex. Bound. Surv., ii, pt. ii, 1859, 36, pl. 41, figs. 1-6 (valley of the Gila and Colorado).—COPE, Check-List, 1875, 29.

Upper surface of head near plane upon its middle region; orbits bordered by a low and rounded-off ridge; its skin being thin and adhering to the skull. Parotoids well developed and subreniform. Eyes and tympanum rather large also. Tongue elongated, broadest posteriorly. Upper jaw emarginated. Two large carpal callosities. A membranous fold at the inner lower edge of the tarsus. Toes palmated; two metatarsal tubercles. Palms and soles coarsely granular. Upper surface of body exhibiting numerous glandular tubercles. A large pustular swelling upon the thighs. Color uniformly dark-green.—*Descr. orig.*

Originally described, as above, from the southern and western portions of the Territory; not observed by me.

77. *Bufo debilis*, Gir.

Bufo debilis, GIR., Proc. Acad. Nat. Sci. Phila., vii, 1854, 57.—GIR., *apud* BD., U. S. & Mex. Bound. Surv., 1859, ii, pt. ii, 27.—COPE, Check-List, 1875, 29.

Bufo insidiosus, GIR., Proc. Acad. Nat. Sci., 1854, 88.—GIR. *apud* BD., U. S. & Mex. Bound. Surv., ii, pt. ii, 1859, Reptiles, 26, pl. 41, figs. 13–18.

Upper surface of head plane and smooth. Snout subacute, protruding. Mouth moderate; upper jaw slightly emarginated. Tongue elongated, tapering toward both extremities. Tympanum inconspicuous. Parotoids large and elongated, obliquely situated across the shoulders. Limbs moderate. First finger equal to the second in length. A carpal disk and a tubercle. Toes slightly webbed at their base. Two metatarsal tubercles. No membranous fold at the inner lower edge of the tarsus. Skin papillous above, warty beneath. Above of a bluish slate, but with black markings. Beneath unicolor, of a dingy-yellow tint.—*Girard, l. c.*

Chihuahua and "Sonora" (*i. e.* Arizona).

78. *Bufo woodhousii*, Gir.

Bufo dorsalis, HALLOW., Proc. Acad. Nat. Sci. Phila., 1852, 181 (*nec Spix*).—*Id.*, Sitgreave's Rep. Exp. Zuñi & Col. Riv., 1853, 142, pl. 19.

Bufo woodhousii, GIR., Proc. Acad. Nat. Sci. Phila., 1854, 86.—*Id.*, U. S. & Mex. Bound. Surv., ii, pt. ii, 1859, Reptiles, 27.—*Id.*, P. R. R. Rep., x, 1859, Gun- nison & Beckwith's Route, Reptiles, 20.—*Id.*, *ib.*, x, 1859, Whipple's Route, Reptiles, 44, pl. 25, f. 1.

Head short and thick; upper central surface but little depressed, not to say grooved; the suborbital ridge being slightly elevated. The occipito-temporal ridge is thicker, and hence a little more conspicuous. Snout rounded; nostrils terminal. Mouth wide; upper jaw emarginated. Tympanum and parotids of moderate size. Limbs rather short and stout; first finger much longer than the second; a large metacarpal disk; toes semipalmated; two metatarsal tubercles, a very large and a very small one; no membranous fold at the inner lower edge of the tarsus. Papillæ of medium size upon the back. Inferior surface with rather small, crowded, granular warts. Above dark-brown, with numerous lines of yellow. A dorsal yellowish vitta running the whole length of the body. Transverse blotches of black upon the thighs and forearms. Beneath ochraceous.—*Girard.*

A species which appears to be of very general distribution in the South-

west, and also in Sonora, hence undoubtedly occurring in Arizona, although I am not aware that as yet specimens have actually been taken within the limits of the Territory.

ARCIFERA.

SCAPHIOPIDAE.

79. *Spea hammondi*, (Bd.), Cope.

Scaphiopus hammondi, Bd., P. R. R. Rep., x, 1859, Williamson & Abbott's Route, Reptiles, 12, pl. 28, f. 2 (Fort Reading, Colo.).

Spea hammondi, COPE, Jour. Acad. Nat. Sci. Phila., 1866, 81.—COPE, Proc. Acad. Nat. Sci. Phila., 1866, 301.—COPE, Check-List, 1875, 31.

Tongue very large, orbicular, without notch behind. Spade highly developed. Color above dark olive-brown, with very indistinct blotches of darker. Summits of dorsal pustulation whitish. Beneath whitish, the chin black. Head and body, 2 inches long; hind leg, $2\frac{1}{2}$. This species is easily distinguished by its nearly uniform and very dark color, without the light lines of *S. holbrookii*.—*Descr. orig.*

Two specimens of this species were taken *in coitu* in June, 1864, near Fort Wingate, N. Mex., considerably extending the previously known range, and indicating the period at which the sexes come together. The animals were found on dry land at a distance from water, in this respect differing from the species of *Bufo*, which, at the period of sexual excitement, seek the water.

HYLIDAE.

80. *Hyla arenicolor*, Cope.

Hyla affinis, Bd., Proc. Acad. Nat. Sci. Phila., 1854, 61 (*nec Spix*).—*Id.*, U. S. & Mex. Bound. Surv., ii, pt. ii, 1859, Reptiles, 29, pl. 38, figs. 4-7.

Hyla arenicolor, COPE, Jour. Acad. Nat. Sci. Phila., 1866, 84.—*Id.*, Proc. Acad. Nat. Sci. Phila., 1866, 301.—*Id.*, Check-List, 1875, 31.

Body rough. Tympanum two-thirds the size of eye. Tibia not quite half the length of the body, but reaching more than half way from anus to center of eyes. Color ashy-gray or green, with numerous rounded, dorsal blotches. Three transverse bands on each thigh and leg. No vermiculation on anterior and posterior faces of hind legs, nor on lower part of sides. A light spot under the eye. Web of hand extending only to the third joint of

the second finger. Arm from elbow less than tibia, but longer than hind foot; about $1\frac{1}{2}$ inches long.—*Baird, l. c.*

The above description makes no mention of the bright-yellow tint of the sides of the abdomen and inner surface of the thighs, which is conspicuous in life.

My specimens are from Fort Whipple. The species was originally described (as *H. affinis*) from Northern Sonora.

RANIFORMIA.

RANIDAE.

81. *Rana halecina*, Bosc. (var.?)

Rana pipiens, GMEL., Syst. Nat., 13th ed., 1788, 1052 (not of authors generally).

Shad Frog, Bartram's Travels, 1790, 274.

Rana halecina, KALM.—DAUDIN, Hist. Nat. Rept., viii, 1803, 122.—HOLBR., N. A. Herp., iv, 1842, 91, pl. 91.—STORER, Mass. Rept., 2d ed., 237.—BD., P. R. R. Rep., x, 1859, Whipple's Route, Reptiles, 45.—COOP. & SUCKL., Nat. Hist. Wash. Terr., 1860, 304, pl. 29, f. 7.—HAYD., Trans. Am. Phil. Soc., xii, 1863, 177.—COPE, Proc. Acad. Nat. Sci. Phila., 1866, 301.—ALLEN, Proc. Bost. Soc. Nat. Hist., xvii, 1874, 70 (and of authors generally).

Rana utricularis, HARLAN, Am. Jour. Sci., x, 1825, 60.—*Id.*, Med. & Phys. Res., 1835, 102, 224.

Rana berlandieri, BD.

Specimens from the Rio Gallo, near Fort Wingate, N. Mex., and along the Zuñi River, where the species is common. They are probably referable to the subspecies *berlandieri*.

CADUCIBRANCHIATA.

AMBLYSTOMATIDAE.

82. *Amblystoma mavortium*, Bd.

a. MAVORTIUM.

Ambystoma mavortia, BD., Jour. Acad. Nat. Sci. Phila., 2d ser., i, 1849, 284, 292 (New Mexico).

Ambystoma mavortium, HALLOW., Jour. Acad. Nat. Sci. Phila., iii, 1858, 352.

Amblystoma mavortium, BD., P. R. R. Rep., x, 1859, Gurnison & Beckwith's Route, Reptiles, 20.—COPE, Proc. Acad. Nat. Sci. Phila., 1867, 184.—ALLEN, Proc. Bost. Soc. Nat. Hist., xvii, 1874, 70.

Amblystoma proserpina, BD. & GIR., Proc. Acad. Nat. Sci. Phila., 1852, 173.—BD., U. S. & Mex. Bound. Surv., ii, pt. ii, 1859, Reptiles, 29, pl. 35, figs. 7-14.

Ambystoma proserpine, HALLOW., Jour. Acad. Nat. Sci. Phila., iii, 1858, 354.

Ambystoma maculatum, HALLOW., Jour. Acad. Nat. Sci. Phila., iii, 1858, 355.—*Id.*,
Proc. Acad. Nat. Sci. Phila., 1857, 215.

Desmlostoma maculatum, SAGER, Penins. Jour. Med., 1858, 428.

Camarataxis maculata, COPE, Proc. Acad. Nat. Sci. Phila., 1859, 123.

Ambystoma nebulosum, HALLOW., Proc. Acad. Nat. Sci. Phila., 1852, 209.—*Id.*, Jour.
Acad. Nat. Sci. Phila., iii, 1858, 352.—*Id.*, Sitgreave's Exp. Zuñi & Col. Riv.,
1853, 143, pl. 20.

Ambystoma ? nebulosum, COPE, Proc. Acad. Nat. Sci. Phila., 1866, 300.

b. CALIFORNIENSE.

Ambystoma californiense, GRAY, Proc. Zool. Soc. Lond., 1853, 11, pl. 7 (Monterey).—
HALLOW., Jour. Acad. Nat. Sci. Phila., iii, 1858, 355.

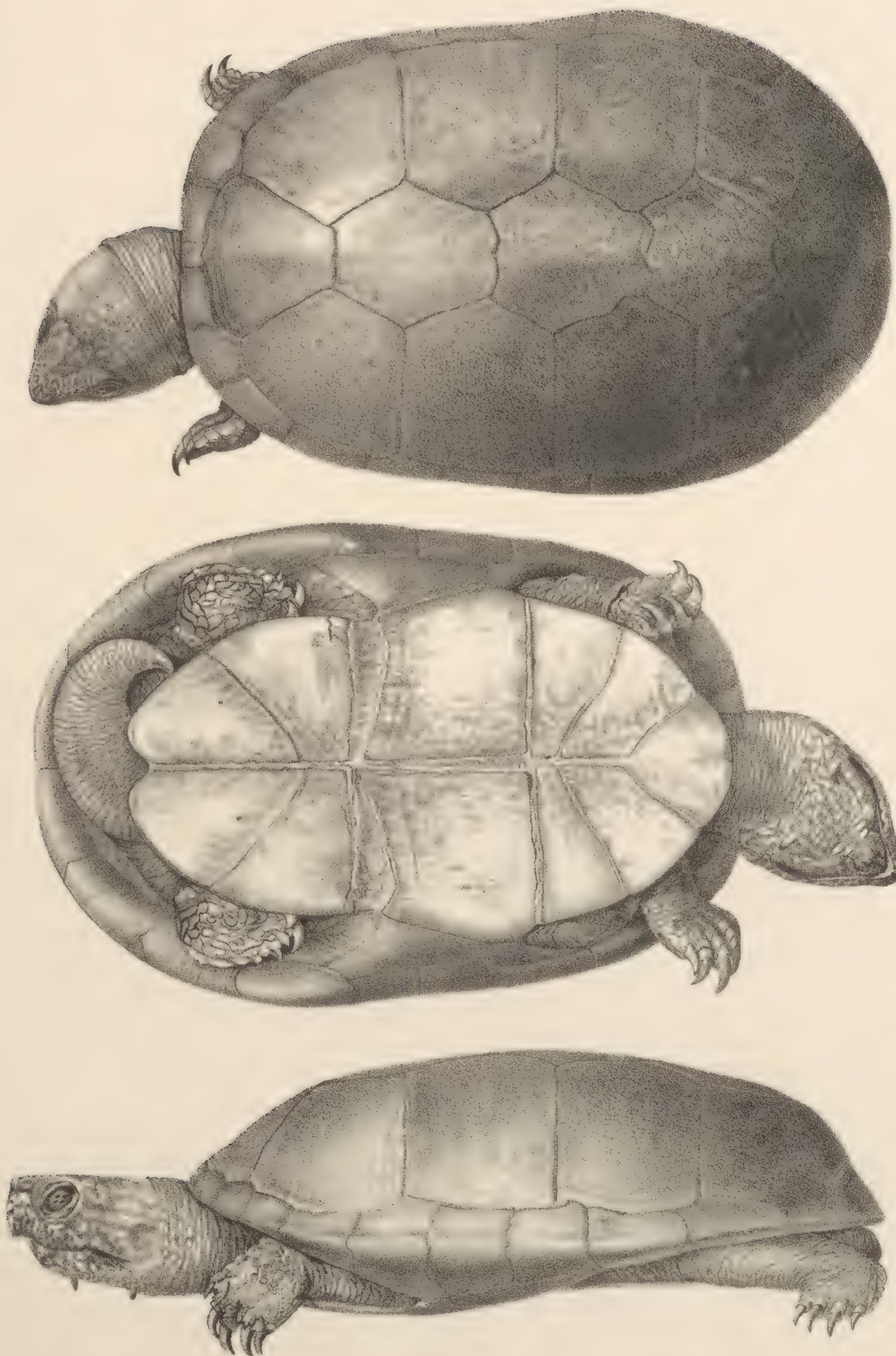
In the *Siredon* stage differing from the *S. gracilis*, Baird, in its oblique branchial arches, with finer pectinations, and in coloration. On the anterior side of the third arch, twenty pectinations, or rakers, may be counted; in the *S. pisciformis* (or *mexicanus*) there are but twelve. . . . Male about seven inches long. Branchiæ well developed. Gular derm free half way to symphysis mandibuli. Twelve costal folds. Muzzle slightly narrowed; jaws equal. Lateral and dorsal pertonæum black. The lungs extend to opposite the inguinal region. Corpus adiposum extending on testes to their anterior extremity. Testes undivided, broad; length equal to half that from axilla to anus; efferent vessels numerous, not entering directly the vas uro-spermaticus. The latter is very slender, lying along the outer margin, but not in contact with the narrow kidney; opposite the latter recurrently convolute, anterior to it straight, and extending to opposite axilla with decreasing diameter. It empties into the rectum near the cloaca. Cloaca protected on each side by a large, vertical, compressed gland, which is fringed on its inferior border (which is received into the lip of the cloaca), and also on its superior margin, which lies next the caudal vertebræ; it is continuous in front of anus; behind the two edges are pressed together. Integument of cloaca thrown into numerous appressed vertical plicæ, as in other *Siredons*. Stomach straight, extending to the left groin, filled with larvæ of *Diptera Nematocera*. Intestines long; rectum large. Female smaller; many of the ova black.

In these animals, the tarsal and carpal bones are fully formed, but cartilaginous. The palatine and pterygoid teeth in continuous series; the

latter slightly separated medially, and concentric with maxillary series. On this character, preserved in a stage of all allied species without branchiæ, I proposed the genus *Camarataxis*, the validity of which can only be established when the development of all our Amblystomas is known. It is a stage nearer the larval condition than the transverse series of *A. opacum*, while the A-shaped series of *A. luridum* is intermediate.—Cope.

Several specimens of this interesting animal are contained in my collections; Nos. 455, 456, ♀, from Jacob's Well, nearly on the boundary between Arizona and New Mexico, and No. 491, ♂, from water holes in the San Francisco Mountains. The foregoing is Professor Cope's notice of these specimens. They are still in the *Siredon* stage, though they have attained a length of six or eight inches, and were confined to the water; on being exposed to the air, the skin dried with remarkable rapidity, but would soon regain its natural condition upon re-immersion. They lived for a half hour or so in the air. The color in life was shining-green above and silvery greenish-white beneath, shading into yellowish about the head and gills, with a few obsolete black spots on the head and back. The now well-known variations in color of this wide-ranging species have necessitated the reduction to synonyms of several species at one time current as valid. Specimens which I lately procured in the northern portions of Dakota and Montana, where they were common in suitable situations, were darker in color than these, more boldly blotched with black, and showed no yellowish hue. They had all completed the metamorphosis at a length of three or four inches, and were often found in damp places at a distance from water.

Amblystoma trisruptum, Cope, Proc. Acad. Nat. Sci., Phila., 1867, 194, from the Ocate River, New Mexico, is a species which may be expected to occur in Arizona.



J. Sinclair & Son Lith. Phila.

FIG. 1. 2. 3. CINOSTERNUM HENRICI.

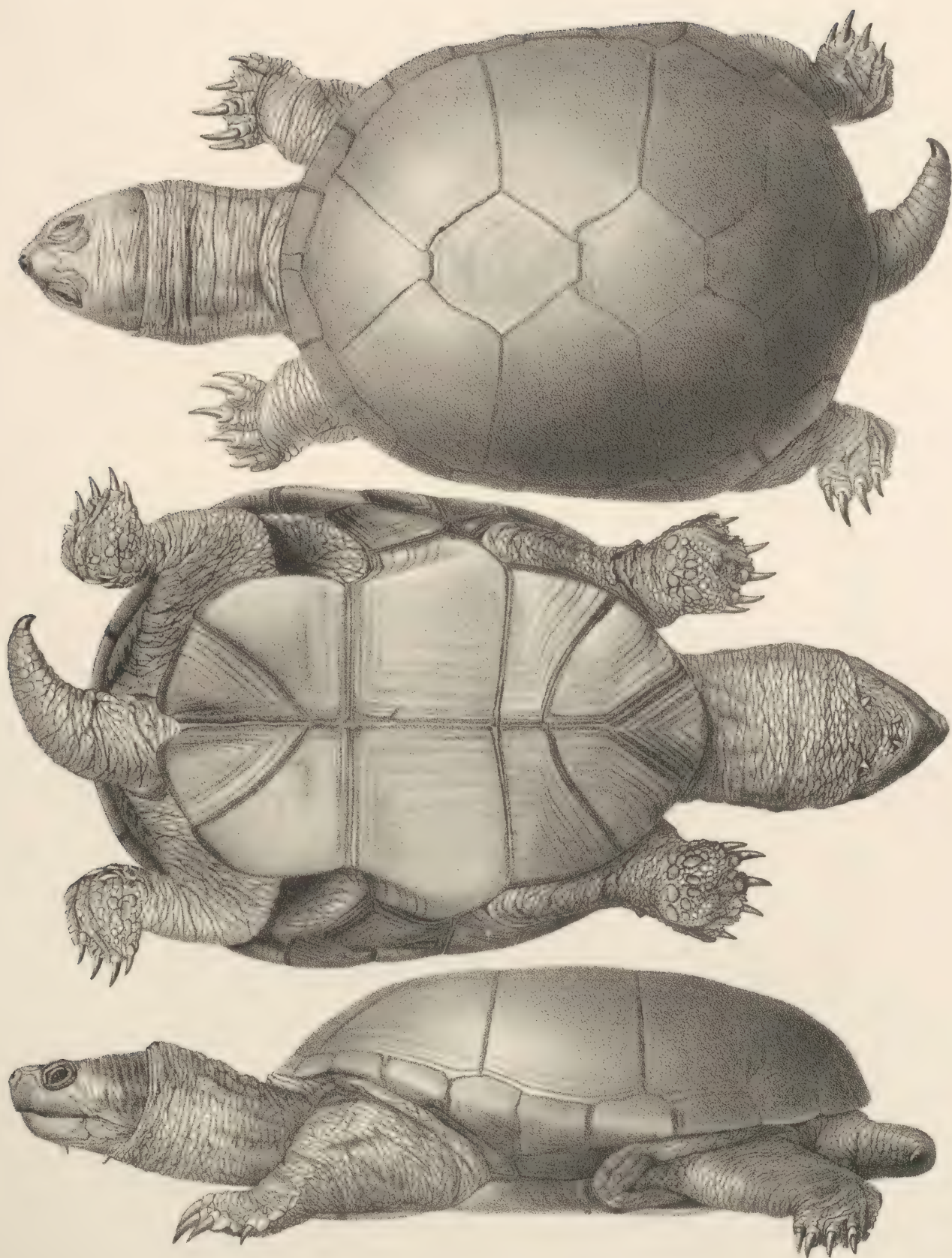
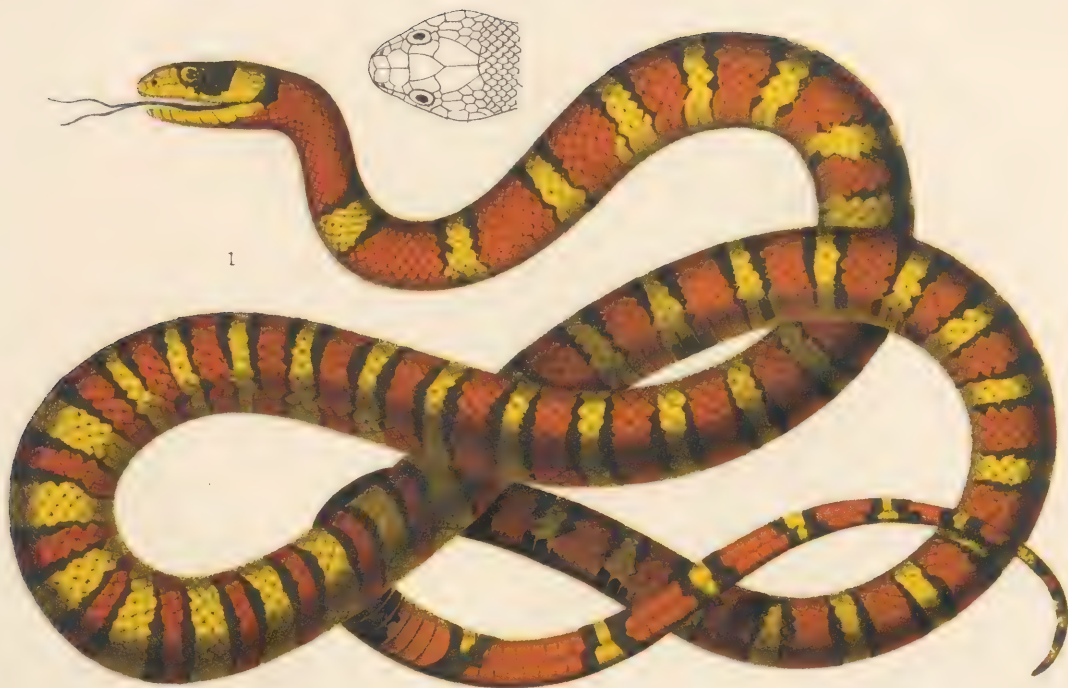


FIG.1.2.3. CINOSTERNUM FLAVESCENS.



T. Sinclair & Son Lith Phila.

FIG. 1 and 1a. *CONTIA ISOZONA*. FIG. 2 and 2a. *GYALOPIMUM CANUM*.
 FIG. 3 and 3a. *CHILOMENISCUS EPHIPPICUS*. COPE.

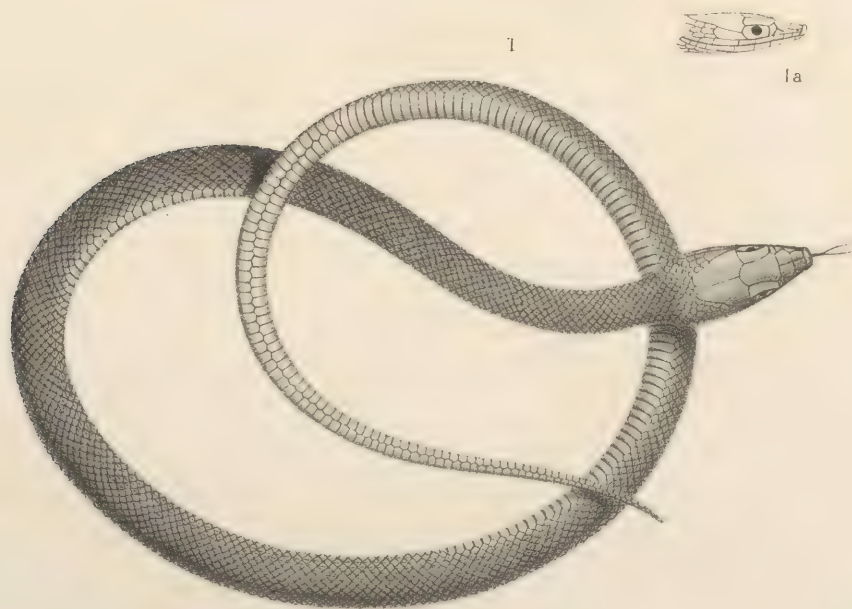


1a

2

T. Sinclair & Son Lith Phila.

FIG.1 and 1a-2. OPHIBOLUS PYRRHOMELAS. COPE.



T. Sinclair & Son, Lith. Phila.

FIG. 1 and 1a. *CHILOPOMA RUFIPUNCTATUM*.
FIG. 2 and 2a. *EUTANIA VAGRANS ANGUSTIROSTRIS*.

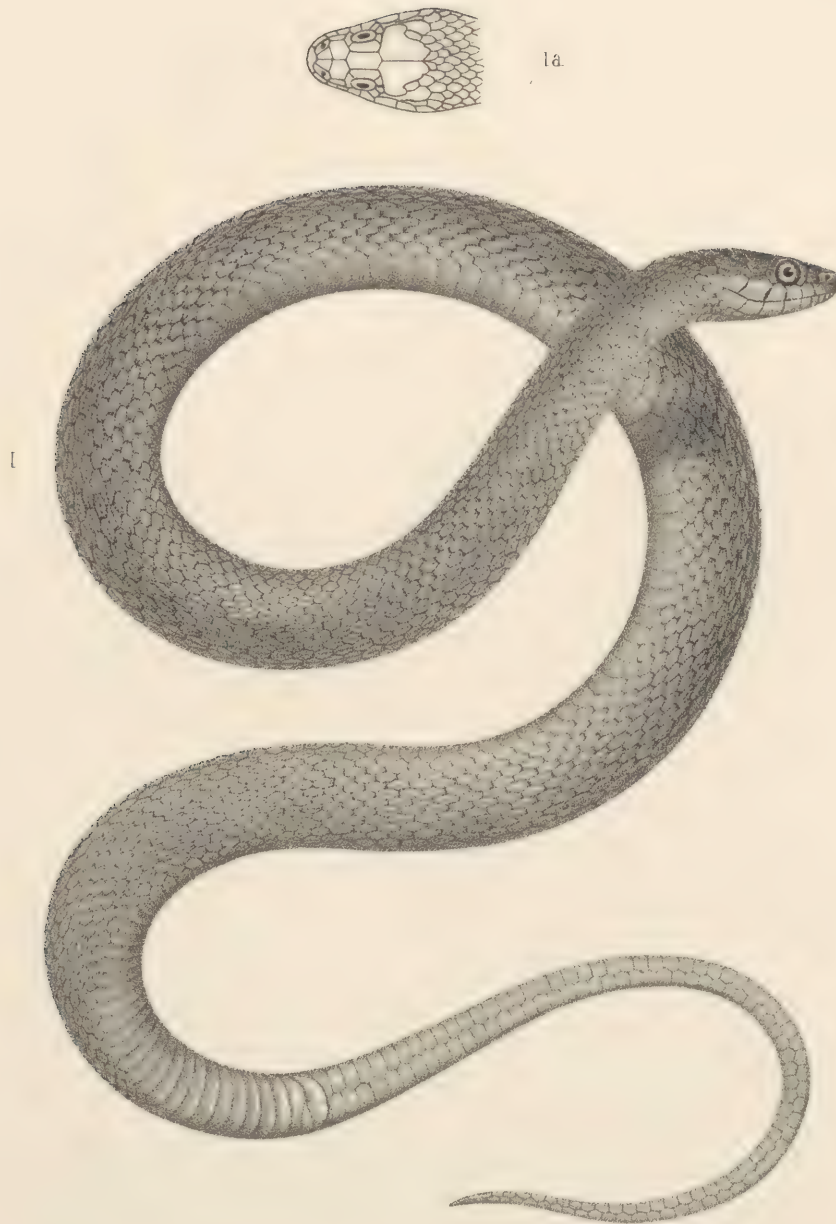
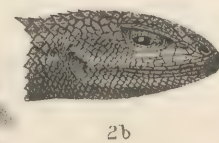
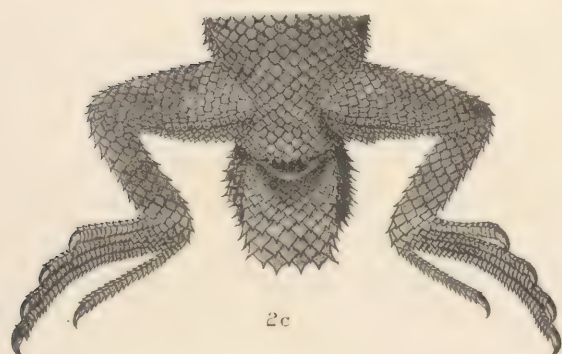


FIG. 1 and 1a. TROPIDONOTUS VALIDUS.



T. Sinclair & Son. Lit. P.M.

FIG.1 and 1a. CROTALUS PYRRHUS. COPE.

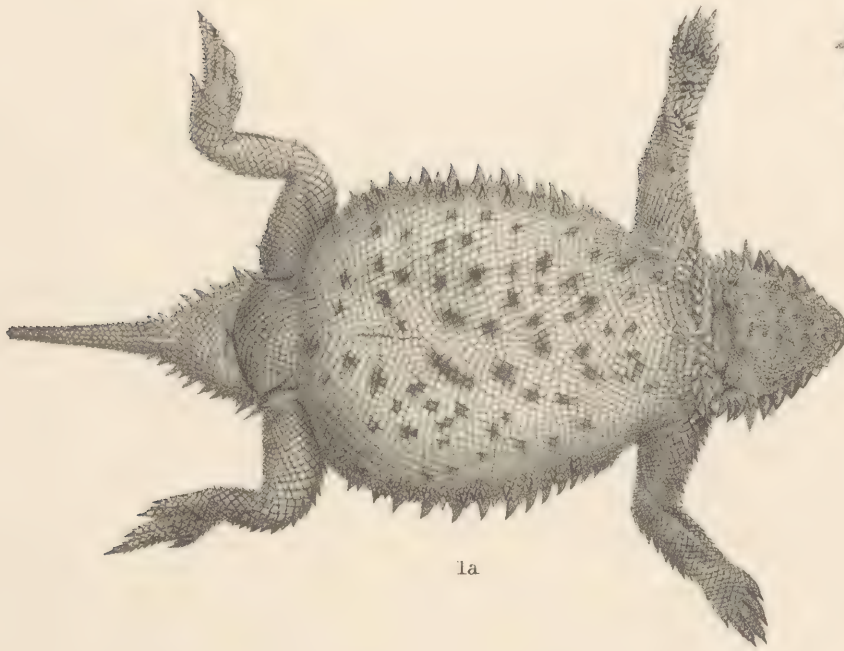


T. Sinclair & Son, Lith. Phila.

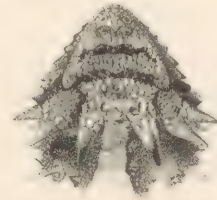
FIG 1 and 1a. SCELOPORUS CLARKII, VAR.
FIG. 2. 2b. and 2c. SCELOPORUS JARROVII.



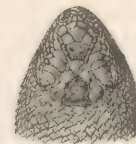
1



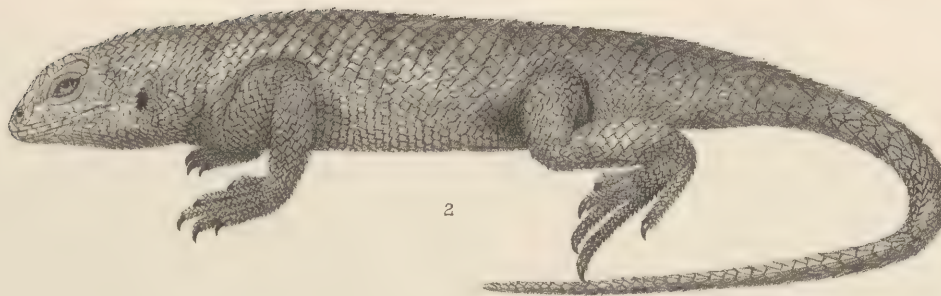
1a



1b



2a



2

T. Sinclair & Son, Lith. Phila

FIG. 1-1a. and 1b. PHRYNOSOMA. PLANICEPS.
FIG. 2. and 2a. SCELOPORUS. SMARAGDINUS.



T. Sinclair & Son, Lith. Phila

FIG. 1-2 and 3. *RANA ONCA*. FIG. 4 and 5. *BUFO PICTUS*.
FIG. 6, 7 and 8. *SPEA STAGNALIS*.

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